

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

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Founder and Editor: STANLEY SPOONER

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1930

Mar. 21 ..	Fencing, Inland Area Competition.
Mar. 22 ..	Inter-Services Rugby, R.A.F. v. Army at Twickenham.
Mar. 26 ..	R.Ae.C. House Dinner, and Ann. Gen. Meeting.
Mar. 26 ..	Rugby Final, Inter-Unit Challenge Cup.
Mar. 26 ..	R.A.F. Cross-Country Championship.
Mar. 27 ..	British Gliding Ass. Inaugural Meeting.
Mar. 27 ..	Fencing, R.A.F. v. R.A.C. at R.A.C.
Mar. 29 ..	S.M.A.E. Gamage Cup Competition. Wimbledon Common.
Mar. 29 ..	Ass. Football. R.A.F. v. R.N. at Millwall.
April 3 ..	"Operation of the Aero-Postale Service in Europe." Lecture by M. P. Grimault before R.Ae.S.
April 5 ..	N.F.S. Air Meeting, Reading.
April 5 ..	28 Sq. (R.A.F.) Old Boys' Assoc. Social at Slater's, High Holborn.
April 5 ..	Aircraft Club, Competition for Models, Harrogate.
April 12 ..	N.F.S. Air Meeting, Hull.
April 19 ..	Leicester Flying Meeting.
April 21 ..	N.F.S. Air Meeting, Hanworth.
April 26 ..	N.F.S. Air Meeting, Leeds.
May 31 ..	Official Opening and Air Pageant, Bristol Airport.
June 7 ..	N.F.S. Air Meeting, Reading.
June 15 ..	N.F.S. Air Meeting, Nottingham.
June 19 ..	Household Brigade Flying Club Meeting at Heston.
June 21 ..	Air Rallye at Haldon Aerodrome, Teignmouth.
June 26 ..	Ipswich Air Pageant.
June 27 ..	R.A.F. Dinner Club Annual Dinner.
June 28 ..	Royal Air Force Display, Hendon.
July 5 ..	King's Cup Race.
July 13 ..	N.F.S. Flying Meeting, Leeds.
July 19 ..	N.F.S. Flying Meeting, Hull.
July 20 ..	International Light 'Plane Tour of Europe, starting from Berlin.
Aug. 7 ..	Norwich Flying Meeting.
July 26 ..	Entries close for 1931 Schneider Trophy Contest.
Sept. 31 ..	5th International Air Congress at The Hague.
Sept. 1-6 ..	Aero Exhibition, Stockholm, Sweden.
Sept. 6-28 ..	Liverpool Air Pageant.
Sept. 20 ..	N.F.S. Air Meeting, Hanworth.
Sept. 27 ..	Paris Aero Show.
Nov. 28 ..	Closing date for the Aga Khan's Prize for Indian Flight.

EDITORIAL COMMENT



Mr. Montague ashamed to talk about economy? Ever since the Armistice each successive Government, whatever party colours it might sport, has worshipped the great god Economy with a fervour such as some ancient Canaanites once displayed towards Moloch, and have passed their children (*i.e.*, the people) through the fire to the glory of that deity. The various Cabinets have cut down below reasonable limits everything susceptible to the knife, except, of course, the income tax, and the salaries of Ministers and Members of Parliament. Now the Secretary of State for Air asks Parliament to agree to Estimates which, while they actually amount to a larger sum than was asked for last year, yet fall short of the increase which might reasonably have been expected in the case of such subjects as air defence and civil flying. A decreased rate of increase, a sort of falling birth rate, is most surely another offering to the economic Moloch; yet the Under-Secretary of State, in introducing these Estimates to the House of Commons, scarcely ventured to breathe the word "Economy." Can it be, we wonder, that the Government has realised that the air is the one sphere in which the exercise of parsimony is really unpopular with the taxpayers? It really looks very much as if this fact—for fact it is—has been grasped. Some grey-bearded old fogeys among us, whose memory stretches back to the days before the war, can recall the case of a Liberal Government which attempted to economise on the battleships of the Royal Navy. It was met by a popular outcry, in the form of a jingle which ran "We want eight and we won't wait," which shook the seats of the mighty, and ultimately shook the Kaiser off his throne. We desire adequate naval security as much as ever we did; but we do believe that the ordinary citizen has now come to see that the future of the British race lies largely in the air. No popularity is to be won by any Government by starving air defence and civil flying. A realisation of this satisfactory

Mr.
Montague's
Speech

state of affairs seems to be reflected in Mr. Montague's speech.

It is true that Mr. Montague did stress the economy of air action as opposed to military action in dealing with certain desert tribes. The interesting stories which he had to tell of air force dealings with refractory sheikhs in Iraq, Aden, Kordofan, and elsewhere made bright patches of colour in an otherwise somewhat matter-of-fact oration. To dispense with 1,600 infantry soldiers from Aden and replace them with one squadron of 12 machines and some 200 officers and airmen, was certainly worth doing. In addition, Mr. Montague was able to show very convincingly that air action (where there are no enemy aircraft) is as economical of blood as it is of treasure. The usual procedure is, first, to drop warnings and hope that some one will be able to read them, and to follow this up by dropping a few bombs where there is no danger of hurting anybody; and this has frequently proved very effectual. It is a procedure which recalls another old and famous jingle. The circling aeroplanes say, in effect, to the recalcitrant sheikhs: "We don't want to fight, but by Jingo if we do —." The said sheikhs, whether they can read the messages or not, almost invariably appreciate the point of the bombs; and on the Iraq frontier 700 tribesmen surrendered without casualties on either side. The Nubas, in Kordofan, however, required a little aimed bombing, three days of it, to be accurate, before the Sudanese infantry could occupy the rebel position. It was stated that the Sudanese suffered no casualties.

It was *à propos* the Schneider Cup and the development of non-regular squadrons that we expected Mr. Montague to plume himself on the Air Ministry's exercise of economy, but we were astonished at his moderation. He did use the once-fashionable word in explaining the Air Ministry's decision not to take part again in the Schneider contest, but he laid no stress upon it. He seemed more concerned about preserving the sporting nature of the contest than about saving the taxpayer's pocket. But life will not really seem much brighter to the taxpayer if his income-tax is increased and Great Britain loses the Schneider Trophy into the bargain, both of which events seem not impossible. Likewise, when Mr. Montague explained that auxiliary and cadre squadrons ought really to form about 25 per cent. of the strength of Air Defence of Great Britain, whereas they actually form at present about 33 per cent. of

that strength, we expected to hear him expatiate on the savings effected by using civilian half-time personnel instead of regular full-time personnel. Such considerations have been put forward openly in the past, and have met with considerable approbation. Mr. Montague, however, explained that it takes longer to train an auxiliary squadron than it does to bring a regular squadron up to fighting efficiency, and that therefore, it was necessary to start the non-regular squadrons earlier in the day. If we really cannot afford to have both types of squadron, and to bring our air defence up to a truly adequate level (Mr. Montague admitted that, when we exclude overseas squadrons, we only maintain a half-power standard) then there is certainly something to be said for going ahead with citizen units. But the main reason for giving them precedence must undoubtedly be economy. This precedence does not exactly tally with another and very admirable sentence in Mr. Montague's speech, which ran: "Our objective is the maximum of efficiency in regard to both personnel and equipment." Quality in preference to quantity is not a bad motto, but no one can maintain that half-time airmen can possibly be so efficient as the regulars are.

In trying to read between the lines of Mr. Montague's speech, we do not intend to pose as hostile critics. We realise the limitations imposed upon the Air Ministry by the general policy of the Cabinet, and we consider that in the circumstances Lord Thomson has done well to prevent his Department from suffering more heavily than it actually has suffered. It is an understood thing that each Minister must support the policy of the Cabinet, and that it would be impossible for an Air Minister to say to the House of Commons that he had asked the Chancellor of the Exchequer for more money, but had not been able to get it. He has to represent that his Estimates are just what he would have made them if the Cabinet had given him a perfectly free hand. Mr. Montague went as far in that direction as he was obliged to go, but did not overdraw the picture. On the whole, he did well in his first Estimates speech, and deserves congratulations on his effort. If, as seems likely, he purposely avoided stressing the economies which have been forced upon the Air Ministry, we think that this is evidence of a wholesome spirit in the country, and we should like to compliment Mr. Montague on his acumen in recognizing the direction in which the wind is blowing.

DEATH OF LIEUT.-COL. BARKER, V.C.

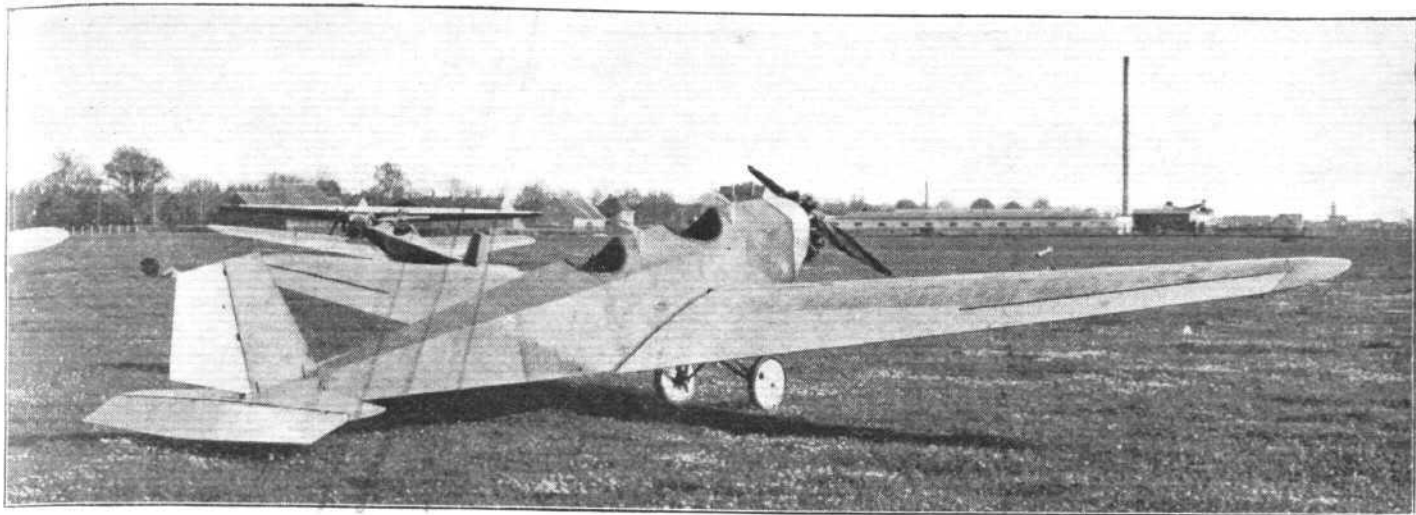
WE very deeply regret to have to record the death, on March 12, of Lieut.-Col. William George Barker, V.C., D.S.O., M.C., etc., while testing a Fairchild aeroplane at Rockcliffe, a suburb of Ottawa. The machine apparently stalled and nose-dived on to the frozen Ottawa River. Col. Barker was killed instantaneously.

In the whole history of the war in the air no two names are more illustrious than those of the two Canadian V.C. pilots, Barker and Bishop. Barker was officially credited with 52 enemy aircraft destroyed, but his name will chiefly be remembered for the great fight in which he won the Victoria Cross. It was certainly the greatest and most heroic air fight in the war. We cannot do better than quote the account of it given in the *London Gazette* :—

"On the morning of October 27, 1918, this officer observed an enemy two-seater over the Forêt de Mormal. He attacked this machine, and after a short burst it broke up in the air. At the same time a Fokker biplane attacked him, and he was wounded in the right thigh, but managed, despite this,

to shoot down the enemy aeroplane in flames. He then found himself in the middle of a large formation of Fokkers, who attacked him from all directions, and was again severely wounded in the left thigh, but succeeded in driving down two of the enemy in a spin. He lost consciousness after this, and his machine fell out of control. On recovery, he found himself being again attacked heavily by a large formation, and, singling out one machine, he deliberately charged and drove it down in flames.

"During this fight his left elbow was shattered and he again fainted, and on regaining consciousness he found himself still being attacked, but, notwithstanding that he was now severely wounded in both legs and his left arm shattered, he dived on the nearest machine and shot it down in flames. Being greatly exhausted, he dived out of the fight to regain our lines, but was met by another formation, which attacked and endeavoured to cut him off, but after a hard fight he succeeded in breaking up this formation and reached our lines, where he crashed on landing."



THE B.F.W. MESSERSCHMITT M.23a : This version is fitted with a 40-h.p. Salmson AD 9 engine

THE B.F.W. M.23

A German Light 'Plane with Many Variations

DESIGNED by Herr Dipl.-Ing. Willy Messerschmitt, and built by the Bayerische Flugzeug Werke, of Augsburg, Germany, the type M.23 two-seater light 'plane is available in a variety of forms, or rather with a choice of different power plants. The standard engine plate has been designed for the A.B.C. "Scorpion," but the machine can be supplied with any of the following engines: The Armstrong Siddeley "Genet," the A.D.C. "Cirrus II," or the Siemens SH 13. Either of these engines can be fitted without material changes to the machine being necessary. The range covered is not, however, exhausted by this list. By making small modifications, the machine can be had with more powerful engines, such as the "Cirrus III," or even the "Cirrus-Hermes."

For identification purposes the machine is known, when fitted with either the "Scorpion" or the Salmson engine, as the type M.23A, and when fitted with either of the more powerful engines it is known as the M.23B. The main data relating to weight, performance, etc., of the machine when fitted with the different power plants have been collected in a table. It will be noted that in all its versions the M.23 has a very good ratio of useful load. Thus, in the "Scorpion" version, the useful load is exactly equal to the tare weight of the machine. The tare weight itself is low in all versions.

So much so that even the "Hermes"-engined machine is well within the F.A.I. classification of light 'planes. Exactly how the structure weight has been kept down to such a low figure is not clear, but it may be recollected that the machines exhibited by the B.F.W. Company at the Berlin Show were

	M.23a		M.23b			
	Scorpion	Salmson A.D.9	S.H.13	Genet	Cirrus III	Hermes
Weight empty (lb.)	484	550	726	627	803	792
Useful load (lb.)	484	506	583	550	517	528
Weight loaded (lb.)	968	1,056	1,309	1,177	1,320	1,320
Length o.a. (ft.)	21.8	21.8	21.3	21.82	21.1	21.1
Wing span (ft.)	38.7	38.7	38.7	38.7	38.7	38.7
Height o.a. (ft.)	7.55	7.55	7.55	7.55	7.5	7.5
Wing area (sq. ft.)	155	155	155	155	155	155
Wing loading (lb./sq. ft.)	6.25	6.82	8.45	7.60	8.52	8.52
Power loading (lb./hp.)	25.5	23.8	16.1	13.64	13.2	11.0
Top speed (m.p.h.)	81	87	99	102	112	115
Landing speed (m.p.h.)	37.3	38.5	41	40.4	42.2	42.2
Climb to 3,300 ft. (mins.)	13	9	5.5	5.8	5.0	4.5
Ceiling (ft.)	10,750	12,100	15,400	18,400	18,700	19,680
Tank capacity (galls.)	15.4	15.4	22	22	22	22
Flying range (miles)	570	500	495	495	435	435

all of low tare weight compared with their gross weight. The German system of stressing, load factors, etc., is different from ours, but it would scarcely be safe to say that it is inferior. We believe we are right in stating that the condition of nose diving at terminal velocity does not have to be met by German designers, but that the stresses thus arising are taken care of by other assumptions. However, that may



THE B.F.W. MESSERSCHMITT M.23b : Except for the fact that it is fitted with the "Cirrus" engine, this is similar to the machine flown to victory in the Tour of Europe by Morzik last year



THE B.F.W. MESSERSCHMITT M.23b : Fitted with Siemens SH 13 70-h.p. engine, this machine secured first place in the International Light 'Plane Tour of Europe last year

be, it is interesting to reflect that the M.23B fitted with the "Hermes" engine would, for instance, be eligible for the International Touring Competition to be held this summer. As this version has a top speed of 115 m.p.h. (185 km./h.), it might conceivably come very close to gaining the full 195 points awarded for an average speed of 175 km./h. (108 m.p.h.) around the Circuit of Europe.

Constructionally the M.23 is of simple type, with a plywood-covered fuselage and a wooden cantilever wing, partly fabric-covered and partly plywood-covered.

A tubular mounting carries the engine, and the engine compartment is separated from the fuselage proper by a fire-proof bulkhead. The petrol tank is housed in the deck fairing, aft of the engine bulkhead, and is placed sufficiently high to give direct gravity feed. The central portion of the fuselage is a light framework of spruce, covered with plywood, and contains the two seats in tandem. The rear portion of the fuselage is of somewhat lighter, but similar construction, and terminates at the rear in a horizontal knife's edge.

The cantilever wing is of wood construction, with a single main spar and an auxiliary spar, the leading edge being covered with plywood to form, with the spar, a plywood tube of approximately "D" section, a form of construction which has become popular in Germany for gliders, and which is very effective in resisting torsion. The wings have a pronounced taper, both in chord and thickness. Folding is provided for, one of the attachments to the fuselage being in the form of a universal joint which permits the wing, when the other attachments are released, to be tilted up with its chord vertical, and folded back along the sides of the fuselage.

The undercarriage is of the "split" type, with axles

of chrome-nickel steel tubing hinged to a central pyramid. The tail surfaces are of the cantilever type, *i.e.*, without external bracing, and the fin and tail plane are covered with plywood. All control cables are led through the interior of the fuselage, none of the cranks being exposed.

The two cockpits are fairly roomy, and are normally equipped with dual controls and instruments. When the machine is not to be used for school work the front control stick can be removed.

Aerodynamically, the M.23 looks a clean and efficient design. To British eyes, however, the placing of the rudder wholly above the fuselage, with the tail plane and one-piece elevator below it, seems to be an undesirable feature and somewhat likely to render the rudder control at large angles less effective than we are accustomed to, owing to the "blanketing" of the rudder which the horizontal surfaces below it may be supposed to bring about.

The placing of the two seats, very close together, is doubtless good for instructional purposes, but their separation, the front cockpit being moved farther forward and the rear cockpit farther aft, would have improved the view from both. Even as it is, however, the view is by no means bad, and the separation of the cockpits would have necessitated a longer fuselage.

Herr Messerschmitt is one of the rising German designers, and the B.F.W. firm, under his technical direction, has proved itself an energetic and enterprising concern. Doubtless, therefore, several B.F.W. machines will be taking part in the International Touring Competition, and in view of that fact we have thought that British readers would be interested to learn what sort of machines the British competitors are likely to be "up against."

THE ROYAL AERO CLUB OF THE UNITED KINGDOM
(Official Notices to Members)

THE annual general meeting of the Royal Aero Club will be held at the club premises, 3, Clifford Street, London, W.1, on Wednesday, March 26, 1930, at 8.30 p.m.

A house dinner will be held at the club, prior to the annual general meeting, at 7.30 p.m. The price of the dinner is 6s. Members wishing to attend are requested to notify the secretary. The Right Hon. Sir Philip A. G. D. Sassoon, chairman of the club, will preside.

Committee Ballot.—The following members have been nominated for the nine vacancies on the Committee:— (1) Captain H. E. P. D. Acland; (2) Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C.; (3) Captain H. S. Broad;

(4) Major A. Q. Cooper, D.S.O., A.F.C.; (5) Major C. J. W. Darwin, D.S.O.; (6) A. H. Downes-Shaw; (7) Flight-Lieut. G. G. H. Du Boulay; (8) Major A. R. Goodfellow; (9) Colonel F. Lindsay Lloyd, C.M.G., C.B.E.; (10) John Lord; (11) Squadron-Leader R. L. G. Marix, D.S.O.; (12) Lieut.-Col. J. T. C. Moore-Brabazon, M.C.; (13) Lieut.-Col. M. O'Gorman, C.B.; (14) Major H. A. Petre, D.S.O., M.C.; (15) St. John T. Plevins; (16) R. L. Preston; (17) Air Commodore C. R. S. Mason, C.M.G., D.S.O.

Offices: THE ROYAL AERO CLUB
3, CLIFFORD STREET, LONDON, W.1.

H. E. PERRIN, Secretary

INTER-EMPIRE AIR POLICY

AT the Twelfth Congress of the Federation of Chambers of Commerce of the British Empire, which is to be opened by H.R.H. The Prince of Wales at the Guildhall on Monday, May 26, a number of Resolutions on civil aviation are being put forward by the London Chamber of Commerce. These have been prepared by the Civil Aviation Section of which Sir Harry Brittain is the chairman. This section, which has a Standing Committee representative of all branches of the air industry, was the first of its kind to be formed by a Chamber of Commerce in Great Britain, and has been active since its inauguration in July, 1929, in promoting the development of commercial flying.

The importance of developing the Empire's air communications and the value to trade of rapid transit cannot be over-estimated, and the establishment of a complete network of air routes throughout the Empire is the subject of one of the main resolutions to be submitted, which will also impress upon the Dominion and Colonial Governments the need, at any rate in the early stages of development, of granting subsidies for air transport.

The opening of the England-India Service during 1929 and its extension to Delhi this year, as well as the coming inauguration of the Cape-Cairo service, have been widely welcomed, but the Governments over whose territories the route will pass, are to be urged to take all possible steps to establish the ground organisation required for the completion of the route via Calcutta, Burma and Singapore to Australia, and that financial assistance should be given towards the establishment of "feeder" services to these two main Empire routes.

The London Chamber has been actively pursuing the subject of the development of municipal air ports throughout Great Britain, without which, it is felt, no real progress can be made in commercial flying. The need for making immediate provision for aerodromes is a matter which must be brought home to Local Authorities in all the larger towns throughout the Empire. If social facilities can be provided

at the aerodromes, as is the case in Germany particularly, people are more likely to be attracted there and greater interest will be aroused in flying.

In the sphere of postal regulations, there is no doubt that the authorities have had the greatest difficulties and complications to surmount in establishing the air mail, but it is only by persistent effort that the obstacles at present existing will be overcome. The present method of sending forward under-franked letters by the ordinary sea route is a serious handicap to the more general use of the air mail, and is a source of widespread complaint. This regulation of the Universal Postal Union should be abolished forthwith. It should be emphasised that the great Postal systems of the world have been built up on flat rate charges regardless of distance and, accordingly, the development of air mail will be encouraged and accelerated by the adoption of the same principle. The Congress will, accordingly, be asked to urge the adoption of special flat rates for air mail instead of the ordinary stampage on one basis and the air surcharge on another.

Resolutions recommending the extensive use of survey from the air in mapping undeveloped areas throughout the Empire and the provision of facilities for the study of aeronautics in educational establishments are being submitted. In this latter connection, it may be appropriate to mention that such facilities are made available in many parts of the world, amongst which may be included California, U.S.A. and Czecho-slovakia.

In view of these recommendations to be put forward by the Civil Aviation Section of the London Chamber, it is interesting to recall that, at the Third Empire Press Conference held at Melbourne in 1925, Sir Harry Brittain called for a new Inter-Empire Air Policy, and that, in June this year, immediately following the Twelfth Congress of Federated Chambers of Commerce of the British Empire, the Fourth Empire Press Conference will be opened in London, this year being the 21st anniversary of its foundation by Sir Harry Brittain.

CANADIAN CIVIL AVIATION IN 1929

WITH the results of the flying season of 1929 now generally known, it is possible to summarise the aerial work performed by the Royal Canadian Air Force in the various services that that body renders to the Dominion. Ever since the war there has been close co-operation between the Air Force and Departments of the Government; and while, originally, activities were largely confined to forest patrol and aerial photography, of late years it has been found that the aeroplane can be used for many other services in scientific work, and in the administration of Canada's natural resources.

The results obtained during the season of 1929 were more than usually successful in aerial photography. These aerial photographs are used not only for mapping but for water power investigations, timber cruising and estimating geological investigations, and various engineering purposes. In fact, the aerial photographs provide the means for assisting in a material way the ultimate analysis of the resources of a district. As an example, this year an area of over 4,000 square miles was photographed in northern British Columbia for the purpose of taking stock of its natural resources. The preliminary reports indicate that this work was so satisfactory that a wide field of usefulness has been opened up for aerial reconnaissance.

In all, eight detachments of two machines each were used last season, and the aggregate flying time totalled more than 3,400 hours. Activities extended from Nova Scotia on the east to British Columbia on the west, and included work in every province. In all about 70,000 miles were covered by aerial photographs, of which 24,000 square miles were vertical photography and 46,000 square miles oblique. Vertical photography is used by the topographical survey to map rough country, or where great detail is required; while oblique photography has a field of its own in mapping and exploring the great hinterland.

Geodetic Reconnaissance.

Canada has for years led the world in aerial surveying and,

during the 1929 season, has consolidated that leadership by applying, for the first time in any country, aerial methods to geodetic reconnaissance and transportation. This has been done with a marked saving both in time and money, particularly as the work has been largely done by aeroplanes on photographic operations in weather which was unsuitable for photography, and when otherwise the aeroplanes would have been idle. Altogether more than 300 hrs. were flown for the Geodetic Survey of Canada, giving an increase of about 10 per cent. in the utilisation of the photographic machines at no expense for equipment or personnel. This increase, however, tells only part of the story, as two-thirds of the geodetic work was done by one detachment only in its spare time. It is reasonable to assume that, with the benefit of a season's experience in aerial work, the geodetic survey will be able to make use of the aeroplane even more extensively in the future.

The operations this year have shown that the geodetic reconnaissance, both general and detailed, can be made by aeroplane, an area being covered in a few hours that would take weeks or months of travel by the usual means. The stations having been selected, the tower-building party can be transported by air and landed on some lake near the station. The work completed, the party is moved to the next station by aeroplane, which brings in on its trip fresh supplies and materials. The observing party sets out its lights by aeroplane, and is moved from station to station in the same way. In addition to all this, the chief of the party, and the head office in Ottawa, are able to keep in almost daily touch with the various scattered units of the organisation.

During the 1929 season the aeroplane was also largely used by the supervisory staff to keep in touch with developments and prospecting throughout the Prairie Provinces and the Northwest Territories. Those engaged in mining activity in many parts of Canada are placing more and more reliance in aerial prospecting and transportation.

as World's Records the best performances under the following headings:—Duration, distance in a closed circuit, distance in a straight line, height, speed. All other records are now known as International Records.

Aviation Records

THE Royal Aero Club issues the following announcement regarding Aviation Records. As from January 1, 1930, the Fédération Aéronautique Internationale will only recognise

PRIVATE FLYING AND CLUB NEWS

BRIAN LEWIS AND C. D. BARNARD, LTD., is the official title of a recent "conspiracy" between Mr. Brian Lewis and Capt. Barnard, which has for its object to be the first firm to deal exclusively in aircraft and aviation equipment. Mr. Brian Lewis, it may be recollected, was managing director of Malcolm Campbell, Ltd., and as such was the first and original "Gipsy-Moth" agent in London. Lewis and Barnard are the successors to the sales side of Malcolm Campbell as far as aircraft is concerned, and will deal with flying material only. In addition to being well known in the motor racing world, Mr. Brian Lewis is on the board of the Aviation Investment Corporation, Ltd. Capt. C. D. Barnard is too well known to need any introduction to *FLIGHT* readers, and is perhaps chiefly associated, in the minds of the general public, with some famous long-distance flights as pilot to Her Grace the Duchess of Bedford.

Lewis and Barnard have taken show rooms at Heston Air Park, where a ground engineer and a salesman will be in constant attendance to arrange for demonstration flights, etc. In addition to being "Gipsy-Moth" agents, Brian Lewis and Barnard will handle all manner of types, and it should be noted that they will be very particularly interested in the Comper machines, for which they have obtained the sole concession for the South of England, their area being bounded to the south by the Channel and to the north by a line running from Gloucester to Ipswich. All other territory in Great Britain will be handled by the Comper Aircraft Company direct from Hooton aerodrome.

As both Mr. Brian Lewis and Capt. Barnard have wide experience of aircraft and of flying, their new firm should do well, and *FLIGHT* wishes them every possible success. Their activities will not, we gather, be confined to the selling of light aeroplanes, but will also include tuition, the organisation of special flights, arranging for the right maps with the best routes carefully laid out for any private owner who may wish to go on a long tour, and general advice on any and all of the minor problems that may from time to time confront owner-pilots.

The London office is at 30, Conduit Street, W.1.

THE COMPER "SWIFT," we are informed, is to be put on the market this spring in two versions, of which the standard model will be sold (with A.B.C. "Scorpion" engine) at £400, while a slightly more elaborate model, to be known as the "Swift de Luxe," will be sold at £450. The latter type will be fitted with Fairey metal propeller, and will have a Rexine-lined cockpit. Of special equipment mention may be made of a streamlined compass mounted on the centre section, a rear view mirror, picketing gear, and waterproof cockpit cover. For this model colour schemes to suit individual tastes will be submitted. With a top speed of more than 100 m.p.h., and an extremely low fuel consumption at a cruising speed of about 90 m.p.h., the "Swift" in both its versions should have a wide appeal among those who like something "snappy," a sort of Bentley of the air, in fact.

THE GUILD OF AIR PILOTS AND AIR NAVIGATORS announce that a meeting of the Court of the Guild was held on March 12. The report of the sub-committee which was appointed to consider the question of associate

membership, and which consisted of Capt. Macmillan, Capt. McMullin, Mr. L. A. Walters and the clerk, was received. The committee recommended in favour of the proposal, subject to certain limitations. As to the class of person to be admitted to associate membership of the Guild the committee thought that he must (a) be a British subject, and (b) be engaged in commercial aviation.



"Lighter-than-air" at Oxford. The first ascent of the balloon belonging to the Oxford University Balloon Union last Sunday was not an unqualified success. The anchor fouled some telegraph wires bringing the flight to an end when only a few miles had been covered.

The committee were of opinion that an applicant should be definitely, though not necessarily wholly, earning his living as a pilot or navigator of aircraft. They further recommended that an Associate Member should have no vote upon any question affecting the conduct or management of the Guild, and should pay a subscription of two guineas per annum. He would be able to apply at any time for membership on satisfying the Court that he had the necessary qualifications. After discussion it was resolved that the matter remain in abeyance for 12 months.

LIEUTENANT C. R. V. PUGH, R.N., recently purchased from National Flying Services a "Moth" (G-EBQW) fitted with a "Cirrus Mark III" engine. After 15 minutes' practice flying, accompanied by Lieut. J. B. Buckley, R.N., he flew non-stop to Le Bourget, from there to Basle, and from



AN AMERICAN TRAINING MACHINE: The Great Lakes Trainer is fitted with an American "Cirrus" engine, and is one of the first light 'planes to be fitted with the new Goodyear Air Wheels.

Basle to St. Moritz, where they landed in the snow on a frozen lake. In a letter Lieut. Pugh says, "I think I may claim a record for a 'Moth' with a 'Cirrus Mark III' in getting to St. Moritz and off again in the snow at an altitude of 6,200 ft., with two up and luggage. I am quite delighted with the little engine, which ran splendidly at all altitudes, and started up with ease after 10 days in 17 degrees of frost."

PARACHUTE SEATS FOR "GIPSY MOTHS" are now being supplied with the standard metal machines. So many private owners of light aeroplanes are adding the parachute to their flying equipment that this is scarcely surprising. The new seat, which accommodates the Irvin Seat Pack, is lower, slightly larger, and curved and flanged to suit the shape of the pack. When the pack is not carried, a special air cushion provided by the de Havilland Company is placed on the seat, and the pilot's position then remains unchanged. As the Irvin Seat Pack weighs but 18 lb. complete, it does not add a prohibitive amount of load to the machine.

COSTES, the famous French long-distance pilot, holder of the world's record in a straight line, with a distance of 4,912 miles, has bought the first French-built "Gipsy Moth." It may be recollected that some time ago the French licence to build the "Gipsy Moth" was granted by the de Havilland Company to the French Morane firm, which has now commenced manufacture, and whose first machine it is that M. Costes has bought. We feel sure the famous pilot will be pleased with his new mount.

BRITISH AIRCRAFT IN AUSTRIA. Although British aircraft have been supplied in fair quantities during the past few years to nearly every European country, it is only recently that Austria has been included. The use of aircraft is in its infancy in Austria, and is not so advanced as in Germany. The de Havilland Aircraft Co., Ltd., has, therefore, lately turned its attention to the Austrian market, where it has not hitherto been represented. Arrangements are now being finalised for the company to be represented in Austria, and full service facilities will be available for "Moth" users in that country. A "Moth" has just been acquired by Ingenieur Nikolaus Eltz, a well-known all-round sportsman, and it is hoped that his example will stimulate the use of British aircraft in Austria. A "Moth" was supplied last year to the Viennese correspondent of *The Chicago Tribune*, who is himself a pilot of many years' standing. This "Moth" has, we understand, given invaluable service and has been flying continuously over Europe.

THE WEYMOUTH GLIDER CLUB was formed recently. At a meeting held in Weymouth, attended by representatives from Weymouth, Portland and Dorchester, it was decided to start a club. Mr. Norman Wright took the chair and answered several questions. A committee was formed to find out more about the subject, and to bring recommendations to another meeting to be held shortly, on whether it would be advisable to build a glider or purchase one. Mr. C. Betts, of Ullswater Crescent, Radipole, Weymouth, is secretary of the new club.

GLIDING ON A SMALL SCALE was begun by the London Gliding Club last Sunday, when two new machines were tried out near Guildford, Surrey. The machines were a

glider built by Mr. Dagnall, of the R.F.D. Company of Guildford, and the other a German "Zögling" type. These machines are intended for preliminary training only, and are not, of course, suitable for such long-distance cross-country flights as have been made by German pilots on highly-efficient craft. Sunday's affair was by way of being a preliminary try-out only, no attempts being made to make long glides from the top of a hill. The machines were, in fact, launched by "bunjee" on practically level ground, short "hops" only being attempted. Among those who tried their hand was Marcus D. Manton, one of the Hendon "old-timers," and Mr. Gordon England, who was among the British glider pilots at Itford in 1922, when he crashed and injured his ankle. Col. the Master of Sempill also tried his luck, as did many others. In spite of the shortness of the "flights," it was possible to test the gliders for trim, controllability, etc.

THE MIDLAND GLIDING CLUB was founded towards the end of February, by Mr. J. V. Rushton of Wolverhampton, and Mr. C. V. Kerpen of the same town. Mr. Rushton had already built a glider and had carried out test flights, so that at the inaugural meeting he could announce that both a glider and a suitable ground were available, and gliding could begin at once. Mr. C. Fenwick, of 17, Victoria Street, Wolverhampton, is chairman of the club, and intending members would do well to get into touch with him. On an initial trial flight, in which a motor car was used in conjunction with the "bunjee" for launching, the car continued onwards after the machine got into the air, and to avoid landing on the car, Mr. Rushton had to turn and make a down-wind landing. In doing so the machine was slightly damaged, but Mr. Rushton was totally unhurt, which goes to show that gliding need not be attended by any particular risk to the pilot.

GLIDING IN U.S.A. is forging ahead. The glider division of the Detroit Aircraft Corporation sold, in one week recently, no less than sixty gliders of the preliminary training type. Mr. John E. Pratt, has been appointed chief glider demonstrator of the glider division, having recently returned to the United States from Germany, where he has been under-



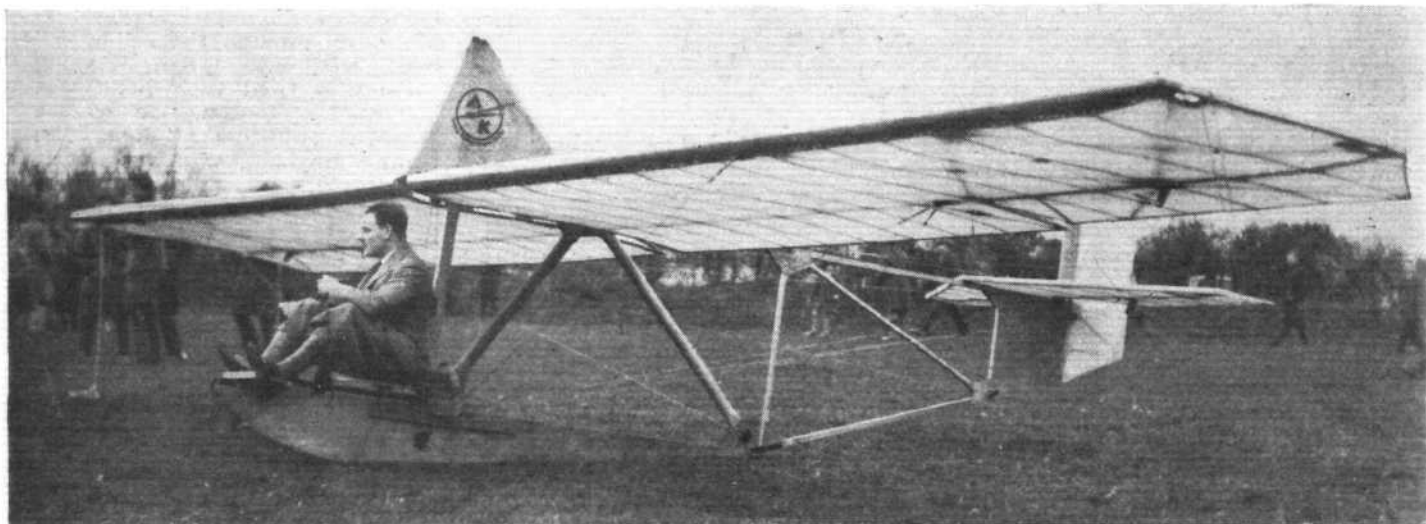
The Household Brigade Flying Club: Recently Mr. R. L. Preston (left) and Captain J. Hargreaves (right) paid a flying visit to Paris in a Klemm-Salmson belonging to Capt. Hargreaves. They are here seen, with Mrs. Hargreaves, upon their return to Heston.

going a course of training at the Rositten school, East Prussia, of the Rhön-Rositten Gesellschaft.

GLIDING IN AUSTRALIA is not lagging behind other countries. The Gliding Club of South Australia was formed some time ago, and now some enthusiasts at Murray Bridge have ordered a similar machine. Kimba and Loxton have each formed a club, and already there are as many gliding clubs in South Australia as in the whole of the rest of Australia. The Adelaide University Gliding Club has followed the German example and have designed and built

per hour, or take 15-minute lessons at 12s. 6d. each. The total expense in getting a certificate is estimated to be £27 10s. whether the pupil goes through an "intensive" course, or whether he gets most of his schooling in 12s. 6d. stages.

READING AIR PAGEANT, we would remind readers, is being held at the Reading Aerodrome, Woodley, on Saturday, April 5. Captain Stack is believed to have organised a really good programme, and the meeting will celebrate the official opening of the Berks, Bucks and Oxon Aero Club.



"BACK TO NATURE" might be the title for this picture, which shows Marcus D. Manton at the controls of the London Gliding Club's machine near Guildford. Mr. Manton was one of the early Hendon pilots, and is now becoming interested in gliding.

their own machine. Mr. R. Duncan, who is president of the University Club, has acted as foreman of the shop during construction.

THE CAPE TOWN FLYING CLUB has evolved a scheme to encourage those who would like to fly. Briefly, the scheme is this: Those who wish may have a trial lesson for one guinea. For this sum the instructor will take them up long enough to test them for aptitude, and will then advise them on their chances of learning fairly quickly. Should the beginner wish to continue, he can do so by paying the entrance-fee and annual subscription of two guineas each, after which he can take tuition at the rate of £2 10s.

THE PRINCE OF WALES may, it is reported, decide to fly from Khartum to Cairo after his hunting trip in Uganda.

THE IRISH AERO CLUB appears to have a legitimate grievance against the Free State Department of Industry and Commerce.

Speaking at the annual general meeting of the above club, Mr. Osmond Esmonde stated recently that although six months ago the Department had assured him that a subsidy to the club would be included in the expenditure on civil aviation, no mention of a subsidy is made in the Estimates.

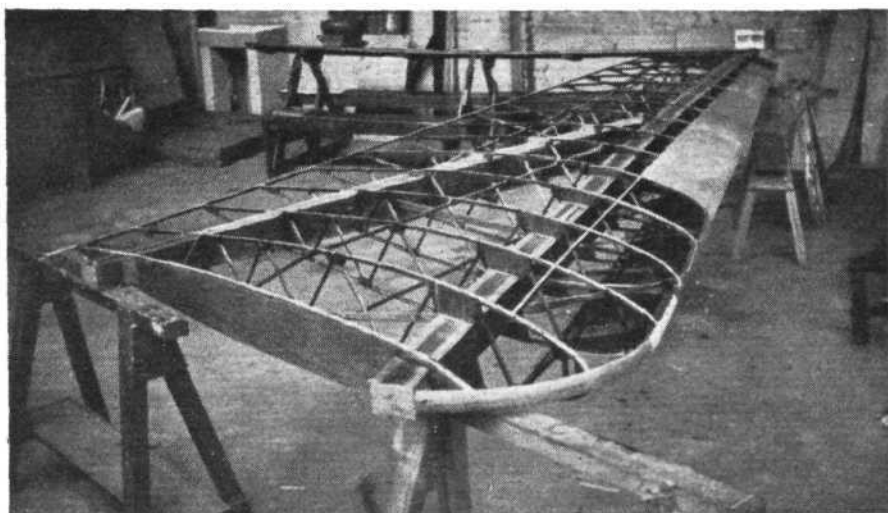


Demonstrative: This "Gipsy-Moth," arranged as a single-seater, will be used by Capt. Broad for giving displays at meetings, etc. The machine can be identified by the red-top fuselage and the registration letters G-AALT. (FLIGHT Photo.)

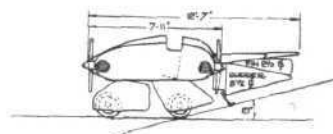
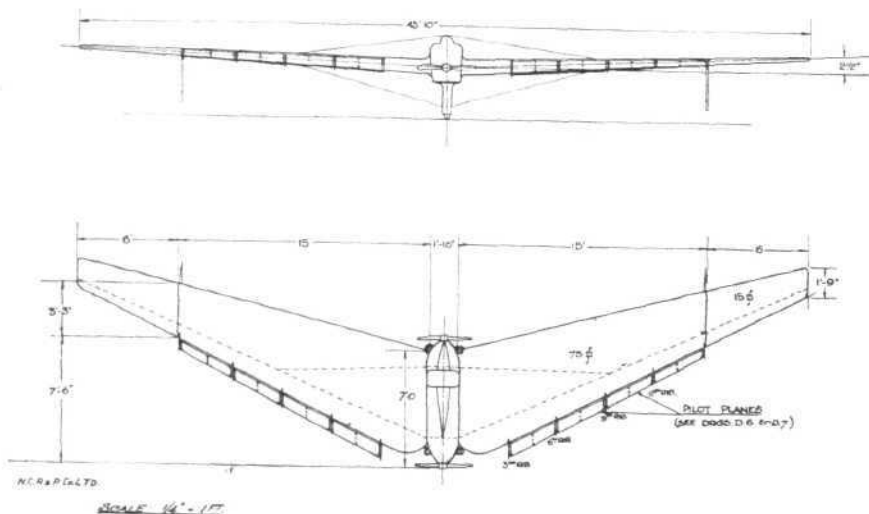
HALTON "METEOR"

ONE does not usually associate very high speed and wide speed range with aircraft of the "tailless" type. Yet these two desiderata have, according to the new handbook of the Halton Aero Club, been kept prominently in mind in planning the "Meteor," a Halton-designed and Halton-built monoplane, which is now nearing completion, and the general arrangement drawings of which are here given.

From past experience the Halton Aero Club has come to the conclusion that really high speed is necessary if prizes are to be won in competitions and at meetings, and the "Meteor" was designed with this object in view. Without accusing the Halton designers of having copied Captain Hill's "Pterodactyl" design, it must be admitted that the Halton "Meteor" has many features in common with that machine. This applies to the general "scheme" only and not to details, which are a good deal different in the "Meteor."



The undercarriage is of unusual type, the two wheels being, like the engines, placed in tandem on the centre-line of the machine. The front wheel is steerable, and should enable the machine to be taxied on the ground with considerable ease. In the air, its side surface and that of its "trouser" will also act as an air rudder, although it seems somewhat doubtful



Although designed as a racing machine, the twin-engine arrangement of the power plant has been chosen, the engines in question being Bristol "Cherubs." One of these is mounted in the nose and the other in the stern of a small nacelle, the pilot's cockpit being situated between the engines.

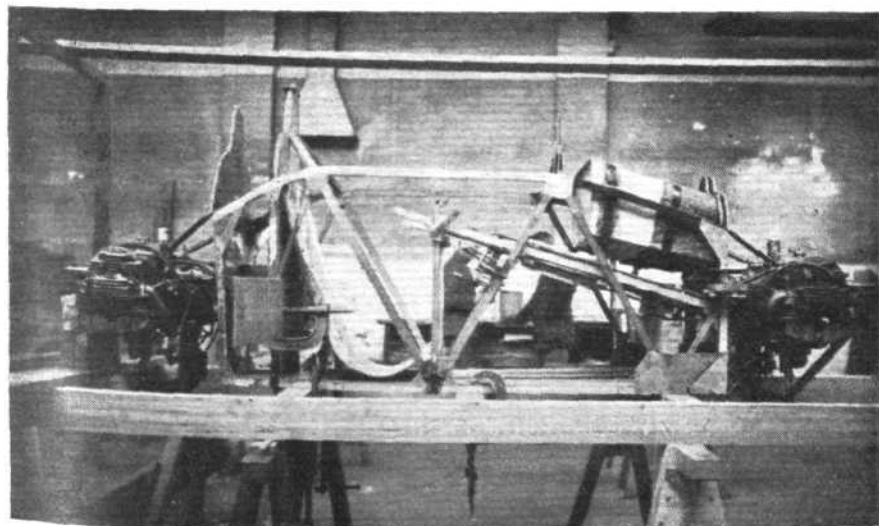
whether this fact will be altogether an unmixed blessing, the wheel being placed fairly far forward. The wheels, by the way, have internal shock absorbers.

Outboard rudders are fitted at the tips of the wing proper, consisting of pivoted surfaces carrying skids so as to balance the machine on the ground when it is "cycling" on its two in-line wheels.

The monoplane wing is tapered in chord and thickness, and has a pronounced sweep-back. At the tips are "controllers" which, worked in the same direction, operate as elevators owing to their rearward location, and when worked in opposition to each other act as ailerons for lateral control. Along the leading edge of the main wings are "pilot planes," which are automatic in action and are designed to have the same effect as Handley Page slots.

Finally, it should be pointed out that the design of the "Meteor" was practically completed by the summer of 1928, but many difficulties have had to be overcome, not only due to the unusual design but also to other causes. It is now hoped, however, that the machine will be finished in the near future so that flying tests can be carried out in the spring of this year.

The designed performance of the "Meteor" is ambitious, the estimated speed range being 25-120 m.p.h. If this is attained it will be the highest speed range of any machine ever produced, and will beat even that of the Handley Page "Gugnunc."



THE HALTON AERO CLUB'S "METEOR": This photograph shows the nacelle with the two Bristol "Cherub" engines. The upper photograph shows the wing in skeleton, while the general lay-out is illustrated in the three-view general arrangement drawings.

THE AIR ESTIMATES SPEECH (1930)

INTRODUCING the Air Estimates in the House of Commons on March 18, Mr. F. Montague, M.P., Under Secretary of State for Air, said:—

"The revised total of last year's estimate, allowing for the Supplementary Estimate of £760,000, was £16,960,000, so that members will see that this year there is an increase in Air Estimates of £890,000 within a total of £17,850,000. This increase is due in the main to the provision of the up-to-date equipment, which is essential alike for safety and efficiency, the growing needs of civil aviation and additional outlay on scientific research work.

"During the financial year ending March 31, five additional squadrons will have been added to the establishment of the Royal Air Force for purposes of Home Defence. One of these is a regular squadron and the other four are organised on a Cadre or Auxiliary basis. This means that the greater part of their personnel are serving under conditions similar to those of the Territorial Army. Their training is of a periodical nature and they would be embodied only in the event of a major war.

"When the plans for the Home Defence Force were first worked out, it was intended that 25 per cent. of the Force might be on this non-regular basis, but at the present time the proportion is much higher, for out of the existing 38 squadrons primarily provided for Home Defence, 26 are regular squadrons and 12 are of the Cadre or Auxiliary type. The proportion of this latter type to the current total strength of the Home Defence Force stands, therefore, at the present time at nearly 33 per cent. instead of 25 per cent.

"The House will understand the reason for this preferential policy in regard to non-regular units when it is remembered that a much shorter period is required for the formation of new regular squadrons. Auxiliary and non-regular units generally have to train their own personnel, both in flying and in ground duties, and they reach a high degree of efficiency if the pace is not forced. So it will be seen that the all-round development of the Air Force on the lines indicated in the Memorandum accompanying the Estimates calls for a larger increase of the slower developing units during the earlier stages of the programme, in order to ensure the due proportion of regular to non-regular units in the end.

"Auxiliary squadrons do not in their early days require to be equipped on the same scale as the regular squadrons. They require in the first instance machines of training rather than service types and so forth. But it must be borne in mind that, as these squadrons reach maturity, provision has to be made for equipping them with up-to-date service aircraft. In fact, the equipment programme for 1930 reflects their growing requirements in this direction.

"I would like to stress the moderation and unprovocative character of British air policy and expenditure. If consideration is given to comparative air strengths and the trend of air expenditure of such Powers as France, Italy and the United States of America, the facts emerge that our Air Force is substantially exceeded in terms of first line strength by these three other Powers and that the estimates which I am now introducing show an actual reduction on the gross figures compared with air estimates of five years ago, in striking contrast with very large increases in the air expenditure of the other Powers during the same period. This, moreover, is despite the fact that our overseas requirements for garrison purposes in the Middle East and India are much greater than those of other countries. On the basis of metropolitan strengths we have considerably less than a half-power standard compared with our nearest neighbour.

"In spite of these facts and figures, His Majesty's Government does not propose to deviate from a policy dictated by the firm intention not to be drawn into a competition in air armaments. Expansion will only take place in so far as it is forced upon us by developments abroad and no other course remains open. The development of the Home Defence Air Force is proceeding slowly on well-considered lines, whose aim is quality rather than quantity. Our objective is the maximum of efficiency in regard to both personnel and equipment.

"It must be remembered when considering these Estimates that Air Forces are being increasingly employed in substitution for Ground Forces, and that thereby considerable economies have been effected. This has been done on a scale not yet attempted by any other nation, and the fact lends greater significance to the modest character of our present programme. The House is well aware, I think, of the success and economy achieved by the use of air power for defence in Iraq, and, if I may quote a more recent instance, we have the case of Aden, where an air squadron has been provided for the last two years with a strength of 12 machines and a total complement of 200 men in replacement of one British and one Indian battalion of infantry with a total strength of about 1,600 combatants.

"The recent disturbances in Palestine soon developed into a problem for the time being, for ground forces, but on their outbreak troops were transported by air from Egypt within a few hours of the request for reinforcements being received. It is true to say that the prompt arrival of 50 soldiers by air did much to prevent further serious riots, but the main activities of the Royal Air Force were directed to reconnaissance patrols, with the object of keeping the authorities informed of any large movements of insurgents across the frontier and within Palestine itself. In some cases, also, aircraft were able to drive off attacks by Arabs upon isolated Jewish colonies before the arrival of ground reinforcements. Offensive action from the air was taken altogether 11 times; this proved the salvation in many instances of otherwise defenceless communities, and there is no evidence of any innocent persons having suffered.

"Towards the end of 1929 the Royal Air Force rendered signal service in dealing with two rebellious tribes subject to Ibn Saud, the King of Nejd, whose leaders, accompanied by their followers, after an unsuccessful rebellion against that monarch, took refuge in Koweit and Iraq. We had given an undertaking to Ibn Saud that we would not afford refuge to these rebels either in Koweit or Iraq proper. In order to implement that undertaking, the Political Officer ordered the refugees to withdraw across the frontier. The refugees refused to go, but they also rejected the alternative offered them by the Political Officer that they should surrender unconditionally to the British authorities. This surrender was the only alternative possible in view of food and sanitary considerations, together with the danger of undesirable complications which might have led to general fighting and widespread loss of life. Eventually, the High Commissioner authorised air action on a limited scale, the immediate result of which was the unconditional surrender of both tribes as required—some 7,000 people—to the Air Force Commander. I may say that in this case the dropping of bombs as a warning proved sufficient, and there were no casualties to the rebels or on our own side.

"Another recent illustration of the efficacy of air action occurred in the Sudan during December, 1929, where a small section of the Nuba tribe in Kordofan offered armed resistance to the police when engaged in the arrest of a certain head man who had defied the Government. The tribesmen took refuge in a strong natural position, and it became necessary to assemble a force of about 300 infantry to deal with them. The local Governor decided to induce surrender by taking air action in the first instance. After three days' bombing the position was occupied by the infantry without any casualties. There is no doubt that but for the preliminary air action undertaken the operation could not have been carried through without heavy loss of life on both sides.

"In the Aden Protectorate in September, 1929, a certain tribe had been guilty of molesting travellers and looting caravans on the road from Dhala to Aden. Stoppage of tribal allowances proved to be of no avail, and the sheikhs were threatened with air action if the offences continued. Several demonstrations were then carried out over the area and warnings were dropped on villages. These measures proved effective, and it was not necessary to resort to air action. No further trouble has since occurred.

"I do not draw attention to these aspects of Air Force activity in order to give them any undue prominence, but I think it is only right that I should lay before the House these instances, which have occurred during the past year, of the prompt effectiveness and humaneness of the use of the Air Arm, when such use, unfortunately, proves necessary.

"On the other hand, a great deal could be said of what might be called the 'non-military' uses of the R.A.F. I might cite, for example, assistance in cases of a medical and surgical character in emergency, particularly in India; rescue work on the coasts in the Middle East; warnings and subsequent reconnoitring of flooded areas in the case of the bursting of the Shyok Dam in India; survey photography, participation in the anti-loot campaign in the Sudan; and at home, co-operation in fishery protection against poaching by foreign fishing vessels on the East Coast. In this last matter a great deal of valuable work has been done, the importance of which has been generously recognised. Excellent service was also rendered by the Royal Air Force at Felixstowe during the gale of December, 1929, when a flying-boat co-operated in a search for overdue fishing craft. A long flight was carried out under difficult weather conditions and in a very high wind and a number of fishing vessels were sighted—the greatest number, in fact, reported by any of the craft engaged in the search.

"While dealing with the work of the Air Force during the year I should like also to refer briefly to the long-distance flights which were carried out. Three Fairey III.F aircraft of No. 45 Squadron completed a flight from Helwan, Egypt, to Nigeria, and the Gold Coast and back, a distance of 8,400 miles. Another four aircraft of the same type from No. 14 Squadron undertook the annual flight to Cape Town and back. It may interest the House to know that the aircraft arrived home again at Cairo after a journey of 11,200 miles, late on their scheduled time to the extent of five minutes. Four long-distance flights were undertaken during the S.W. monsoon by No. 205 Squadron, Singapore, with the object of trying out the weather possibilities for flying and the possibilities of maintaining a pre-arranged time-table between Calcutta and Singapore under adverse conditions. And finally I should wish to pay tribute to the gallantry of the two officers who, after having successfully flown non-stop to Karachi, lost their lives in an attempt to make a non-stop flight to Cape Town.

"It may interest the House to hear something about education in the Royal Air Force. There has been built up an educational organisation which embraces not only the scientific side of the training both of officers and skilled mechanics, but also a comprehensive system of further general education by means of which the Service now affords its personnel facilities which are quite comparable with those which can be obtained in civil life. That there is a demand for this further education is shown by the results of a recent higher education test for airmen, for no fewer than 700 airmen, scattered throughout the Service at home and overseas, entered for an examination of a relatively high standard. There could be no finer testimony to the intellectual calibre of the airmen in the Service, nor a better guarantee that the ranks of skilled mechanics are not likely to be found wanting in the capacity to adapt themselves to new requirements. Airmen are, in fact, provided with educational qualifications which should be of the greatest possible value to them on their return to civil life. Every effort, of course, is made to keep in close touch with the educational and professional institutions and activities of the country.

"The training which is received by aircraft apprentices is one which can well bear comparison with that which can be obtained in civil engineering establishments, and apart from the fact that this training equips the young men with a high standard of technical knowledge, sufficient to enable them to adapt themselves to civil engineering practice, the Service, too, gains a body of mechanics who combine a very high degree of mechanical skill with a sound knowledge of engineering and scientific principles.

"During the year 1927 there were 1,836 boys examined, and out of that number 970 were attested; in 1928, 1,981 were examined and 1,033 attested; whilst in 1929 there were 2,343 examined and 1,072 attested. These figures show that Local Education Authorities, with whom the closest touch is maintained, are co-operating with the Air Ministry in satisfactory and increasing measure.

"As to the training of officers for the specialist branches of technical work such as engineering, wireless, armament and the like, most of this is, of course, carried out within the Air Force itself; but as it is desirable that a few officers should be trained to an advanced stage in the higher theoretical aspects of these branches, a policy has been adopted of making use wherever possible of the resources of the Universities of the country. Thus, every year a number of officers who have already qualified in the Service in engineering and in wireless are sent to Cambridge, there to follow the normal course for the Mechanical Sciences Tripos, whilst others with suitable qualifications are sent to Cambridge or to the Imperial College of Science to follow a course of aeronautical research. I hope I have not unduly stressed this aspect of Air Ministry policy, but I do feel that it is eminently satisfactory that our educational organisation is so well fitted to produce officers and airmen not only with a high standard of technical knowledge, but with a wide outlook upon their work, qualities which will, moreover, be of inestimable value to them later in civil life.

"Coming to technical matters, I have time only to refer to one or two heads of Research and Development, and I will not discriminate between experiments of major interest to the Air Force and those applicable to aviation generally. I am sure it will interest the House if I mention first that the problem of aircraft noise is being actively investigated. The reduction of noise in aircraft will not only make for the greater comfort of passengers, but will reduce the disadvantages of air traffic passing over inhabited areas. It is possible by modern methods to secure measurements of noise, for there are instruments that have been devised in the past few years which have made this investigation a relatively simple one. These instruments show that the intensity of the noise in the cabin of an air liner is 1,000 times as great as that in an express train, although, of course, the human ear does not perceive that difference.

"The chief sources of noise, it has been found, are the engine and the airscrew, when the latter is revolving at a high speed. It is considered almost certainly practicable to reduce the top speed of airscrews, that such reduction will conduce to greater efficiency, and that it will at the same time make a considerable difference in the resultant noise. Parallel with these investigations the question of reducing the noise of engine exhausts by means of silencers has been studied with promising results.

"I may mention that the National Physical Laboratory is co-operating with Imperial Airways and the Dutch Air Lines in acquiring data of the noise in aeroplane cabins, and a series of experiments have been made on sound

transmission through the walls of the cabin. It is hoped that, as a result, good progress will be made in this important matter.

"The problem of aerodynamic interference of one part of an aeroplane with another has also been investigated. It has been found that the resistance of the fuselage and wings of an aircraft to the air flowing past them is in general greater when they are combined together than the sum of their individual resistances when separated. The reason is that each part sets up a turbulence which interferes with the free flow of air round other parts. The importance of this kind of research is shown by the fact that if aircraft had little more resistance than that caused by skin friction, it is calculated that probably only half of the power now necessary would be required for the same result. It will be clear to honourable members that this line of research is all the more important as the limitation of engine power is approached.

"As honourable members are no doubt aware, it has long been the custom for models of ships to be tested in large tanks before their shape is decided upon and construction begun. This policy is followed also with aircraft except that an air channel (called a wind tunnel) replaces the water channel; although for tests upon the qualities of seaplanes a water tank is also necessary. Very important developments are taking place in the construction of wind tunnels. The present type of wind tunnel used can take only quite small models, and they do not provide an air speed much above the landing speed of a fast machine; such low-speed tests do enable a fair prediction to be made of the performance of the full-scale aeroplane when flying at the ordinary angles of incidence of the wings, but when the stalling speed is approached the full scale flow over the wings is no longer represented by the wind tunnel tests, which then become actually misleading; it is just when the aeroplane is near its stall that we most need to know its flying characteristics to avoid dangerous spins or nose dives into the ground. Such tests, of course, have in the past had to be made by test pilots flying test machines, a method which is slow, expensive and dangerous.

"There is a way out of the difficulty, and that way is to run the wind tunnel with heavy air, air made heavy by pumping it to a pressure which gives it a density twenty times as high as it is normally. There is then a compensating effect, and the air flow around the model behaves as it would on the full-sized aircraft. One such air tunnel already exists in the world, and that in the United States, but steps have been taken to build a compressed air tunnel at the National Physical Laboratory in this country. This will have an even higher efficiency than the American tunnel and will enable all types of military and commercial aeroplanes to be tested in model form. It was laid down in last year's estimates and is expected to be completed in 1930-31.

"Great as is this advance in the design of wind tunnels, it does not go the whole way. If the fullest possible reduction in money, cost, time and flying risks is to be obtained, it is necessary to be able to test a full-sized fuselage and airscrew under conditions approximating to actual flying. Let me show the nature of this problem by one example. There are indications that the air-cooled engine, simple as it is, pays a heavy price in increased head resistance, which, however, it may be possible to avoid in large measure if the engine is fitted with a streamlined cowling. On the other hand, such a cowling interferes with the normal air cooling of the engine, and the only way of determining the balance is that of full-scale tests. Again, there is the question of time and money consumed in flying tests, if not the element of risk; for these reasons the American Government decided to build a very large air tunnel to work at normal pressures and at a speed of about 100 m.p.h. The air stream of this tunnel is no less than 20 ft. in diameter and takes 2,000 h.p. to propel it. It is possible, if we are to judge by the experience of the United States aeronautical authorities, to make by this means remarkable advances in aeroplane efficiency, and we hope to be able to explore its potentialities.

"Provision has been made in these estimates for the commencement of work on such a tunnel, and we hope to be able to do so in the course of the year.

"The outstanding achievement during the past year in engine progress was the intensive development of the Rolls-Royce 'R' engine, which was used in the Schneider Trophy winning aircraft. By normal standards, this engine should give approximately 820 h.p., but the two engines used actually sustained an output of over 1,900 h.p. over the course.

"Advances are continuing to be made in the development of air-cooled engines, with their simplicity of installation, freedom from water corrosion troubles and ability to be warmed up before flight in much less time than the water-cooled type. Hitherto, the water-cooled engine has had the advantage of presenting a smaller frontal area, enabling a more efficient design of fuselage to be constructed. This superiority, however, is being reduced in favour of the more simple air-cooled engines by the study of different types of cowling to which I have already referred, of the effect of the shape of the body behind the engine, and the use of the Townsend ring, which, when placed in front of the cylinders of a radial engine, deflects the air flow and decreases the resistance.

"It is hardly necessary for me at this date to do more than mention the Schneider Trophy Contest in September last, which was won by Great Britain in the wonderful speed achievement of 328.63 m.p.h. The result was a triumph which is shared by the Technical staffs at the Air Ministry, the Royal Aircraft Establishment, the National Physical Laboratory, the personnel of the R.A.F. High-Speed Flight, and last, but by no means least, the British aircraft industry. The triumph was increased a few days later when the Commanding Officer of the High-Speed Flight set up a world's record of 357.7 m.p.h. upon a Supermarine-Rolls Royce aircraft.

"As the House is aware, it has since been decided not to continue Government participation in the race for the reasons that an international sporting contest should not be carried out officially by military services and that to do so is now no longer justifiable, in view of the interference with the routine work of the Air Force. Undoubtedly, useful experience has been gained from these contests in the past, and official participation was on that account justified, but further progress can now be made with greater economy by other means. It is hoped that the widespread public interest displayed will make it possible for the Royal Aero Club and the aircraft industry to organise future contests without Government assistance.

"There are many other items of research with which I should have wished to acquaint the House, if time permitted, such as, for instance, an experimental wireless rotating beacon which has been developed for direction finding purposes. The device is considered likely to be of considerable value both for shipping and aircraft, and the cost is being divided between the Board of Trade and the Air Ministry.

"I wish now to pass on to another and most important aspect of Air Ministry work, namely, civil aviation.

"The House will note that there is an increase in the Civil Aviation vote this year. This increase is mainly due to the provision for an additional subsidy in respect of the Imperial Air Service to South Africa, about which I will say a few words shortly.

"The existing service between England and India has now been extended to Delhi under arrangement with the Government of India.

"Existing agreements with the Light Aeroplane Clubs will terminate in the course of this year, with two exceptions. We have given very careful consideration to the future of these clubs. The work which they have done in promoting a practical interest in flying throughout the country has been excellent, and after the most sympathetic consideration of the possibility

of giving them financial assistance when their present agreements expire we have come to the conclusion that it would be equitable and justifiable to give them assistance on the same scale as that now given to National Flying Services, Ltd., and the necessary provision has been made in these estimates. I know that some of the clubs have been anxious as to the future and I hope that the announcement which I have just made will cheer them on to a continuance of the good work which they have done in the past.

"I have mentioned the service to South Africa which is due to commence in a few months' time. The negotiations with the various Union Governments and Administrations concerned, more particularly His Majesty's Government in the Union of South Africa, for the installation of a weekly service between London and Cape Town, have been brought to a successful issue during the year. The Union Government will make a substantial contribution towards the requisite subsidy over a five years' period and will lend their support and co-operation generally. The other Administrations concerned, the Sudan, Kenya, Tanganyika, Uganda, Northern and Southern Rhodesia, have also undertaken to contribute and co-operate in a similar manner. The survey of this route is well advanced and everything is proceeding according to plan.

"It is contemplated that a regular service between Alexandria and Tanganyika should commence in the autumn of this year, and the through service to Cape Town in the spring of 1931.

"I think the House will agree that it is eminently a matter for satisfaction that with the practical financial support and assistance of the Union Government of South Africa, and the other Administrations which I have named, this great Imperial trunk air route will before long be inaugurated.

"Hon. members will probably wish me to refer to the position of the projected service to Australia which will complete the other great outstanding Imperial Trunk route. The Government of India have now extended the England-India service from Karachi to Delhi by means of aircraft chartered from and operated by Imperial Airways. The preparation of the ground organisation of the route across India is being vigorously pushed forward. The section to Calcutta will be ready by the end of March, and it is hoped that by the autumn sufficient progress will have been made to render possible operation to Rangoon. The Government of India are now examining the question of the possibility of extending the air service from Delhi to Calcutta and to Rangoon at the earliest opportunity.

"Proposals have also been submitted to the Air Ministry for the operation of the remaining section between Rangoon and Australia, and it is hoped to find means, in conjunction with the Governments of India and Australia, to inaugurate the through service to Australia as soon as possible after the route along the coast of Burma has been organised. It would be premature at the moment to give an estimate of the date by which the route will be in operation, but the House can rest assured that this project will be pressed on with as a matter of the first importance.

"I now come to a matter of more than ordinary popular interest—'Airships'—and before stating the present position, I think it is not only convenient but necessary to explain the origin of the programme decided upon in 1924.

"The Airship branch of the Royal Air Force was closed down in 1920-21, and negotiations of various kinds were undertaken with a view to transferring the existing fleet of airships to some outside body, with a view to their commercial operation.

"I need not go over airship history during the intervening period; but in 1922-23 two schemes were put forward by Commander (now Sir) Dennis-Burney for taking over the factory, plant and existing airships, carrying out a programme of research and building a fleet of airships to operate a commercial service to India, in consideration of large Government subsidies. Ultimately the Government in 1924 decided upon a smaller scheme, the main features of which were the carrying out by the Air Ministry of a full programme of research and experiment and the building of two airships of 5,000,000 cub. ft. capacity, one to be built by the Royal Airship Works and the other by a private company. The design and construction of these airships were to be based upon the results of the theoretical and scientific investigations carried out since the disaster to R.38, and to comply with rigid requirements as to airworthiness (laid down by the Aeronautical Research Committee) as well as the independent inspection of the Director of Aeronautical Inspection. The carrying out of a flight to India by each airship was to be a last stage in flying trials, to be followed by a continuity period of development before commercial operation was undertaken.

"This meant the design of two airships nearly double the size of any airship yet constructed in the country; and their construction to comply with exacting requirements as to factors of safety and to provide passenger accommodation on a scale never before attempted. As a result of the Imperial Conference of 1926, there was a further requirement imposed of carrying out a flight across the Atlantic to the mooring tower erected by the Canadian Government at Montreal.

"These two ships are in being; R 100, built by the Airship Guarantee Co., Ltd., has a gas capacity of well over 5,000,000 cub. ft., whilst R 101, built at Cardington, will exceed this capacity when the alterations which are now in hand are completed. R 101 was moored out during the whole of November and confounded the prophets of disaster by successfully riding out storms in which the wind gusted up to 83 m.p.h. During a line squall the airship swung through 135° in a minute under a wind of 35 m.p.h. The maximum force registered by the bow indicator was something over 15 tons, though the airship is designed to withstand a strain of 30 tons at this point.

"There is no doubt that from a constructional point of view the completed airships have definitely disproved many of the gloomy forecasts, ranging from minor defect to utter disaster, which have been made from time to time, and I would like to say at this point that both in the press and in public speech many criticisms have been made that have been based upon predictions very far indeed from accurate knowledge of the facts.

"The meteorological investigations of the Indian route which have been proceeding steadily show that conditions will generally be adverse on the return journey both between Karachi and Ismailia and Ismailia and Cardington, with a consequence that a large reserve of fuel will have to be carried for the first experimental flight to the East of R 101. Allowance also must be made for the fact that the lift of an airship decreases as the temperature rises and the barometer falls, since its lift is determined by the weight of the volume of air which it displaces, and warm air is lighter than cold air. For these reasons, having regard to the need for a "safety" policy in a programme of this expensive character, it was decided not to attempt the return flight to India in March or April. The flight might well have been attempted with success, but unnecessary risks would have had to be taken. Consequently, an extra bay will be inserted in R 101 during the summer which will increase her capacity by 500,000 cub. ft. and give her an additional net lift of about 9 tons. The suggestion that has been made of this additional bay providing for an unanticipated defect is not true. The bay, with the consequential extra lift, is found to be possible not because of defect, but because of the satisfactory strength which the airship's tests have disclosed.

"The proposed programme for 1930 for R 100 consists of flights to Montreal and back between May and September, and between October and March schedule flights between Cardington and Ismailia. For R 101 a flight to Karachi and back in September or October, then again to Karachi in December or January, after which there will be mooring

trials and experimental flying from Karachi. The minor alterations to R 101 should be completed by the end of April, and certain flights may take place preliminary to the programme mentioned.

"Regularity, of course, is essential for commercial operation, and before this stage is reached it is obvious there must be a period of experimental flying on the Indian route to acquire operational and financial data and data for further technical developments.

"There is also the desirability of developing a mechanical means for the transfer of an airship from the mooring tower to the shed when it is necessary to undertake major repairs, and these estimates provide for experiments to be made to evolve a satisfactory system.

"I apologise for taking up so much of the House's time, but I felt that hon. members would desire an adequate statement in reference to both the Service and Civil aspects of these Estimates. I will, of course, do my best to deal with particular points that may be raised in debate. Air progress well, I am convinced, be rapid in the future, both in technique and safety. We cannot but desire that our country should stand well in this as in other forms of material progress, bearing in mind that the test of all material advance is its moral value as a means of human civilisation and world friendship."

DEBATE ON AIR ESTIMATES

THE following is a *résumé* of the Debate on the Air Estimates which opened in the House on March 18:—

SIR SAMUEL HOARE opened the debate by congratulating Mr. Montague on his speech. He asked the Under-Secretary whether the policy of the Government adhered to the policy of building up the home defence force to 52 squadrons as a first stage. After eight years of expansion this country was only fourth or fifth in the list of air Powers. He then turned to the question of air disarmament. He took the view that in the years to come the most urgent disarmament question would be that of air disarmament. It was a sinister fact that the expenditure of all the great Powers, except ourselves, on air armaments was literally bounding up year by year. The expenditure of France had risen no less than 113 per cent. during the last five years, that of Italy 25 per cent., and that of the United States of America 140 per cent.

What was the policy of the Government in this question of air disarmament? The Preparatory Commission would be renewing its sittings at Geneva in the course of the next few weeks, and he would like to know what were the programme and policy that the Government were going to urge before that Commission. He would urge the Under-Secretary to use all his influence to keep the problem as simple as possible, and that, if he could not obtain complete agreement over the whole field, he should begin along the lines of least resistance and advance stage by stage. He would warn him to keep clear of the mass of technical details that some representatives at Geneva had heaped on this problem during the last few years. He would suggest to him that he should investigate again the possibilities of arriving at a parity agreement between the three great Western air Powers—France, Italy and ourselves—for he believed that along that line there was a chance of successful development. An agreement of that kind would be the best basis for a more general agreement being reached at the League of Nations between all the Powers.

The ex-Air Minister then turned to the Schneider contest, and asked for greater details of the Government's policy. Did the Government decision mean that some of the high-speed machines that were now being built to Government order would be lent to the entrants, or did it not? Did it mean that, although an Air Force unit would not be posted to undertake the race, Air Force officers would be allowed to act as pilots or as officers in the British team? Unless assistance of this kind was given to the Aero Club and to anyone else who could make an entry, it would be found, in face of the Government competition of other countries, that we would not be able to bear the expense or produce the crews or the machines. While he could not blame the Government for withdrawing, as a Government, from entering into the contest, he would be very sorry to see the race go by default in two years' time to another country.

Sir Samuel then asked for information about the civil air routes to India and Australia. He asked how it was that, while France and Germany had obtained flying facilities over Italy, we had at present no similar facilities. As to the Australian section of the route, what was the position about the section between Singapore and Australia? He should be glad to hear that the Australian Government would provide a proportionate amount of the cost of the whole route.

Sir Samuel then turned to the wider question of air power. He would ask the attention of the House to what was really the basic question of air expenditure:—What was the use of air power to the British Empire? What part should air power play in the system of Imperial defence? They had had about 10 years of peace-time experience, and during that time they had accumulated a considerable amount of data that helped them towards at least a provisional answer. The one pre-eminent lesson that emerged from 10 years of experience was that air power, unless it was to be nothing more than an additional burden upon the taxpayers' shoulders, must be used as a substitute for and not as a supplement to other forms of defence. If the Royal Air Force was simply to be added to army and naval garrisons and to be made a third adjunct to their defence operations, the expense of national defence would be bound up and our insurance premium become so heavy that we should not be able to afford it. In Iraq we substituted air power for the previously existing form of military defence, and the result had been a reduction in expenditure from £21,000,000 in 1920 to £1,500,000 in 1930, the withdrawal of between 20 and 30 Imperial battalions, and an actual reduction of Air Force squadrons from eight to four. The Air Force took over the garrison of Aden two years ago, and the result had been to reduce the expense of that garrison by more than 30 per cent. There had been incursions across the frontier for many years, but a single squadron of the Royal Air Force re-established British prestige on the frontier with scarcely any loss of life, at a cost of about £8,500, whereas by the old methods of defence it was calculated that the cost would have been between £6,000,000 and £10,000,000. Upon the North-West Frontier of India and in the Sudan the Air Force had been no less successful in maintaining law and order at a cheaper cost, and in carrying out quickly, efficiently, and with scarcely any casualties the military operations that had been assigned to it. The mere fact of being able to fly an aeroplane over territory in which disorder was on the point of breaking out had been sufficient to re-establish law and order without the dropping of bombs or any kind of military operation.

So uniform and successful had been our use of air power in the last 10 years that he asked the House to consider whether the time had not come substantially to extend it. On the one hand there was the demand year by year for reduction of defence expenditure. On the other hand there was the need to involve ourselves as little as possible in military campaigns and protracted military operations. He believed that air power could help us to satisfy both these needs. His experience had been that year by year there seemed to be a wrangle between the Treasury and the three Service Departments when the time drew near for drawing up the annual Estimates. In the end reductions were effected, some of which, at any rate, were definitely injurious to the efficiency of this or that Service, the existing system being taken as the basis of negotiations. Although that might be the line of least resistance, it was the most dangerous way of making economies. Would it

not be wiser and safer to settle these questions fundamentally and make really drastic changes in the system in certain carefully considered directions rather than go on cheeseparing? He suggested that in the further substitution of the air arm we had the means of making a substantial alteration in the whole system of Imperial defence, of saving money and, at the same time, not making less efficient any of the existing Services. If we made fuller use of the mobility—might he say also the fluidity?—of air power, that could act as a corrosive acid where military action was necessary and act like oil where pacification was needed; if we could make our defence capital more liquid, not tied up as it was tied up at present, he believed we could safely make further reductions in our defence expenditure, without any loss to the security of any part of the British Empire. At the same time we should have to arrange for quicker decisions to be taken in Whitehall. The time had come for a comprehensive enquiry on the lines which he had suggested. He might be considered prejudiced, and he had once been told that he had been bitten by a mad aeroplane. Let the enquiry be carried out by impartial authorities. With 10 years of experience and the evidence, there was now a mass of material which an inquiry of this kind might fruitfully investigate. He believed that as a result of an inquiry it would be found, for instance, that air power could be safely, economically, and effectively used to a greater extent than at present on the North-West frontier of India. We should find by the inquiry that air power could be used on a greater scale in India. The defence of India was largely a question of air defence. He had never believed it possible for an invader to penetrate the passes of the mountains which divided Afghanistan and India if there was a really strong air force on the Indian frontier.

An inquiry would find that the newer types of flying-boat could be usefully used for some of the coastal defence work now undertaken, often under unhealthy conditions, by old and sometimes out-of-date sloops and coast defence craft. It was only in the last year or two that we had been able to develop the kind of flying-boat that could carry out those duties. He would be more cautious in his predictions as to airships, but he believed that—not in the next few months, but in the not too distant future—it would be found that airships could undertake at least some of the long-distance reconnaissance work now undertaken by cruisers. Airships might also be useful as troop carriers for the Army under certain, perhaps restricted, conditions. It was with those ideas in view that year after year he went doggedly on with the airship programme.

He believed that an inquiry would come to the conclusion that the development of civil air lines might have a very useful part in the organisation of our Imperial defence. He did not wish to see civil air lines started which were outwardly civil lines, but were really intended to be strategic military lines, or that civil machines should be developed which were a hidden reserve for military aeroplanes. Civil and military aviation should develop quite distinctly. He wished to see civil air lines developed as a civilising force in the various parts of the Empire for which they were organised.

MR. MANDER hoped that some statement would be made as to the future of subsidies for the light aeroplane clubs. He suggested that pilots should be trained by these clubs, and not at special schools. Compulsory powers should be granted to municipalities to acquire land for aerodromes.

REAR-ADMIRAL SUETER said that the sum of £500,000 was too small for the development of civil flying.

MR. MALONE advocated a Ministry of Defence. If we were safe in the air with 1,292 fighting aeroplanes as compared with 4,730 possessed by France, there was no need to stick out for a two-Power naval standard. He said that the airships were a failure, and urged the Government to cut its losses. He suggested a committee to review the whole situation.

CAPT. BALFOUR supported the suggestion of Sir S. Hoare for an impartial inquiry. He urged that an aircraft carrier should be sent to Buenos Ayres for the exhibition in 1931.

MR. KINLEY regretted that there had not been a substantial reduction in the Royal Air Force.

SIR PHILIP SASSOON said that the present Estimates would not disgrace the previous Administration, and he congratulated the Government on having preserved continuity in their policy. The United States, with its nearest air rival many thousands of miles distant from its shores, was prepared to spend £33,000,000 in the coming year. It was the best judge of its needs, but when that huge figure was borne in mind the claim that our Estimates demonstrated once more the earnest desire of the Government to avoid disastrous competition in armaments was fully justified. The continued encouragement given to the Auxiliary Air Force squadrons was very satisfactory. He asked for an air squadron to be formed for the University of London. The question of a new Air Ministry in Whitehall, would, he said, soon have to be tackled. It would be cheaper and more convenient.

MR. MONTAGUE, in reply, said that the Government was in full sympathy with all that could reasonably be done to secure common action in the direction of disarmament. He had been asked in reference to the Schneider Trophy whether there would be Government assistance in the form of lending high-speed aeroplanes or lending officers to assist the participation of this country in the next contest. He must give a complete negative in answer to that question. It was not proposed to give Government assistance of that kind. Every other kind of assistance that was possible would be given, and a great amount of assistance could be given, in the way of technical advice and other sympathetic ways. But it would not be possible to lend either machines or officers. It was very questionable whether any other country would give Government support of that character next time. The question of substituting the air arm for other arms in various places was before the Cabinet, and he could not make any statement.

With regard to the air mail to India, negotiations were still proceeding with the Italian Government as to the possibility of a route via Naples and Corfu.

Any light aeroplane club which would conform to the existing conditions could apply for recognition and if approved would be eligible for payment in respect of its members from April 1.

He did not admit that the expenditure on airships should have been cut down, but this was not the time, when the country possessed two airships which were fine productions, which had proved stronger than was anticipated, and which had carried out flights in an exceedingly satisfactory manner, to say that further trials should not go on because of the extra expenditure involved.

In the debate on Vote A, Mr. Montague mentioned that it was the intention of the Air Ministry that Pembroke Dock should be used for a flying-boat squadron. It might also be possible to locate there one or two minor units. The total number of civilians employed was not likely at first to exceed 40, and would rise eventually to 60 or 70.

THE NAVY ESTIMATES

The Fleet Air Arm

THE Naval Estimates include a gross sum of £1,267,000 to provide for the Fleet Air Arm, and, of course, the net amount is identical with the gross sum. The provision last year was £1,300,000. The arrangement, as our readers are doubtless aware, is that the Admiralty orders the aircraft, engines, and accessories required through the Air Ministry, and pays the cost of the Fleet Air Arm. The sum appears in the Air Estimates under the heading

Appropriations-in-Aid. In the statement which accompanies the Naval Estimates, the following passages occur:—

Co-operation between the Services

Combined exercises with the Army and Air Force have again been arranged as part of the annual programmes of squadrons whenever it has been possible to do so. Exchanges of officers between the three fighting Services during tactical exercises have been arranged, and the experience gained has proved of considerable value.

Naval Air Work

Good progress continues to be made in all branches of naval air work, and the amount of flying carried out by embarked aircraft shows steady increase. Eighty-two naval officers are now employed as observers, and six

more are under training. One hundred and twenty Naval and Royal Marine officers are serving as pilots in the Fleet Air Arm, and 29 are under training for this duty. Of this total, 25 officers have been appointed for a period of general service, on the conclusion of which they will resume flying duties.

Wireless Telegraphy and Signal Development

The working of naval shore wireless telegraphy stations on both long and short-wave has been improved during the past year by reorganization and the use of recent developments in technique. Ipswich and Sheerness wireless telegraphy stations have been closed, and a new station for receiving purposes only will shortly be open at Flowerdown, near Winchester, utilizing buildings and land relinquished by the Royal Air Force. Certain modifications in apparatus are being made to effect greater control of emitted wireless waves, in order to comply with international requirements.

KING ALBERT FLIES TO BAGHDAD

KING ALBERT of the Belgians has once again shown his belief in air transport. A few days ago he was in Cairo, accompanied by his Foreign Minister, M. Hymans, when he suddenly announced his intention of flying to Baghdad on a private visit in a Hercules belonging to Imperial Airways. The day fixed for the flight was Saturday, March 15. It was only on that day that reports of His Majesty's intention reached Brussels, and created dismay among the less enlightened members of the Government. They reflected that the flight would be over a great expanse of desert, and they exclaimed that a forced landing there might be a very serious affair. They either overlooked the fact, or were ignorant of it, that a Hercules does not forced-land. M. Jasper, the Premier, wired to M. Hymans urging him to dissuade the King from undertaking such a rash adventure. All was in vain. King Albert duly started off on the Saturday with Maj. Brackley as pilot, and (*mirabile dictu!*) arrived safely at Baghdad the same afternoon. The King is said to have been greatly impressed by the view of Baghdad and the golden domes of the mosque of Khadimain as seen from the air. The High Commissioner, Sir Francis Humphrys (of Kabul fame), is entertaining the King at the

British Residency. Soon after King Albert's arrival, King Faisal of Iraq, accompanied by his brother the ex-King Ali, visited him at the Residency and said how glad he was to welcome the gallant King of the Belgians to "the famous city of the Arabs in the days of their grandeur." King Albert replied that he was sure that King Faisal would restore the former glory of the country. The King then spent five days flying in a R.A.F. aeroplane to places of historic interest in Iraq.

The programme arranged was:—Monday, Ur of the Chaldees; Tuesday, Babylon; Wednesday, Mosul, Nineveh, and Nimrud. The programme, however, was varied, for on Tuesday, the 18th, King Albert, King Faisal, Sir Francis Humphrys, and Air Vice-Marshal Sir Robert Brooke-Popham all flew in a Victoria to Ramadi and inspected the Police Camel Corps, raised from among the Arab tribesmen. It is said that King Albert's tall, stalwart figure has greatly impressed the Iraqis, for Orientals admire a big man. A special R.A.F. aeroplane was offered to the King for his return flight to Cairo on Friday, the 21st, but His Majesty declined this and booked a seat in the home-bound Hercules on that date.

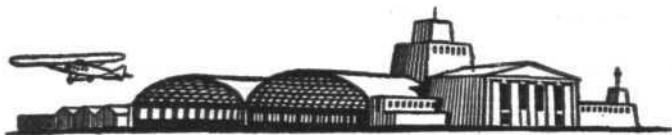
Italian Air Estimates

GEN. BALBO, the Italian Under-Secretary for Air, introduced the Italian air estimates on Friday, March 14. The total amount asked for was 718,000,000 lire (about £8,000,000). He said that no new civil airways would be opened, but that existing ones would be developed. In the

air force they had found the S.55 marine bomber satisfactory and it would become standard equipment. He stated that the example of France impelled them to adjust their expenditure on aeronautical and on other military objects. Italy was a country very vulnerable from the air, and could only be made safe by a strong air force. The speech was wildly cheered.



DISTINGUISHED VISITORS AT STAG LANE: On Monday of this week the de Havilland Aircraft Company had the privilege to show their works to some Canadian visitors. Our group shows, from left to right, Captain G. de Havilland, Mr. A. S. Butler, Mr. C. C. Walker, Mr. Black, Col. the Rt. Hon. J. L. Ralston, Minister of Defence and Canadian delegate to the Naval Conference, Mr. T. S. Hearle, Squadron Leader Shearman, Canadian Liaison Officer, and Major Brown, Col. Ralston's Secretary. (Flight Photo.)



AIR TRANSPORT

GERMAN COMMERCIAL AIR TRANSPORT

Mr. Martin Wronsky's Lecture before the R.Ae.S. and Institute of Transport

MR. MARTIN WRONSKY, General Manager of the German Luft Hansa, read an interesting paper on German Commercial Air Transport before a joint meeting of the Royal Aeronautical Society and Institute of Transport on March 10. We give below an extract of this paper.

In his opening remarks Mr. Wronsky said the essential basis of good relationship between nations—that to understand each other they must know each other—also applied to the realm of commercial aviation, and the present developments of commercial flying demanded that the nations interested should work with and not against one another.

He asked that he might first be permitted to refer to a few facts which had greatly influenced the development of German aviation, and which, he thought, were impossible to overlook. Germany, vanquished in the World War, was obliged under the Treaty of Versailles to refrain from any colonial activities and from any military flying. This, from the beginning, placed their flying on a completely different basis to that of other European powers. They lacked the invaluable technical data for the commercial machine obtained from the development of the military machine with its advanced constructional design, and they lacked Colonial air ports, which automatically tended to direct aerial activities in a certain direction. It was, therefore, essential not to lose sight of Germany's complete absence of military and Colonial flying.

In the spring of 1919, Germany decided to explore the possibilities of the aeroplane for transport purposes, and comparative short routes—about the distance of London to Manchester or London to Edinburgh—were utilised. These, however, left much to be desired both in the way of regularity and frequency. The initiative for the opening of such routes in those days lay exclusively with private enterprise, which was chiefly subsidised by the larger shipping firms, the banks, and the still remaining aircraft industry, which formed small transport companies. Their activities in many cases did not cover an area larger than Wales, and it was quite apparent that in consequence of their restricted spheres, they could not be a lasting success.

In the spring of 1923 the first steps were taken in German aviation which led to the creation of two large concerns. These two, which in their actual organisation were united, appeared outwardly to be in the strongest competition, thus hindering the combining of work and capital, and the possibilities of creating a united air organisation and traffic policy. After three years of competition, in which both concerns rendered valuable pioneer work, an agreement was reached, resulting in the fusion into a single concern the German Luft Hansa. Just as Imperial Airways, Ltd., in Great Britain, the Luft Hansa in Germany was commissioned by the State to carry on the development of civil aviation, but in nowise did it confer a monopoly, as actually any concern, although without State subsidy, was at liberty to enter into aviation in Germany. Whereas the British Government demanded repayment of the subsidy out of any future profits, with Luft Hansa the subscriber, being a shareholder of the company had a right to participate in the direct profits; although for the present the subsidy was so finely calculated that no actual profits could be made. The Luft Hansa constituted a limited company; the German Empire, the German states and towns, and all leading industrial, banking and traffic undertakings were shareholders. Mr. Wronsky considered this, at the present stage of development, to be the best constitutional form, in which, together with a certain amount of State sanction, far reaching possibilities were given to the activities of a private company which served the whole country. Especially was this so in the administrative respect, where its character was emphasised as a pure transport undertaking, and for the development of transport, and

independent of the aerial industry, which was designed for constructional purposes.

After the amalgamation, the "regional" German air companies—which previously operated transport routes independently—agreed to give up their independence, and for a share-participation placed their aerodromes at the disposal of the Luft Hansa. Their main duty to-day was to further the aerial transport idea in their own district, and to interest the Government and the industry in the organisation and maintenance of certain inner German routes, and to obtain for these the necessary subsidies.

When the German Luft Hansa as a monopoly air transport company was created, the various States made their agreements on condition that certain guarantees be given by the Government for the development of the internal German air transport. As a company, sanctioned by the Government, the German Luft Hansa had also to fulfil in this respect far-reaching transport obligations.

This condition of affairs, in many respects, had its good points, said Mr. Wronsky. Germany could not maintain any military air activities, so the technical developments of the aeroplane and instrument industry were really only in the possession of the Luft Hansa. Thus every new line, if only of a distance of 100 km. offered an enlargement of the development field, giving possibilities for improvement to material, and experience to staff, and making it possible to revive the industry. It could be claimed that the German air industry and transport would not have reached its present position so quickly if the internal German air developments had not worked on these lines. Through the internal German air lines the technical development received, and still receives means which otherwise would have been unobtainable, as these lines were mainly subsidized by the various states and towns. Furthermore the internal German air system had made the German people "air minded."

Germany today had over 70 to 80 aerodromes and landing grounds, created during the last 10 years, in the layout of which the most modern experience of airport building and development technique had been utilised.

The main duty of the Luft Hansa was the linking up of Germany with the International European and world service of the future. The Luft Hansa had built up its whole international transport policy on the idea of a commercial co-operation.

He thought the continent of Europe had reached saturation point as regards air transport companies. It must not be forgotten that the working expenses to a large extent are met out of public funds and that open competition would scarcely be possible in this part of the world in the next few years. Later, when the financial success of air transport was assured the companies of each country could compete. Absolute co-operation on international basis must remain so long as all companies live on the expense of the taxpayer. Air companies of Europe should combine in organising large outer European routes, and not work against each other.

Regarding the policy of the German air transport in Europe, Mr. Wronsky again pointed out that Germany did not possess any colonies, and thus certain aims of their traffic policy were not so obvious as in the case of Great Britain or France. Germany's duty was to create regular and safe express connections between Germany and all the neighbouring States, between the centre and the periphery of Europe, for the furtherance of German Trade.

With regard to the organisation of routes beyond Europe, the German air transport policy had been queried. It was said that countries possessing no colonies and mandates need not pursue air services beyond Europe, but no imperialistic ambitions governed Germany. World transport was a business, allied with world trade, and world trade demanded world transport! Therefore they did not want to confine

themselves to the borders of Europe, but wished to participate in world transport, even if only to those places of the globe commercially connected with Germany. They were chiefly confining themselves in establishing a connection between Germany and those countries, both in Europe and outside, which were already highly developed industrially. Another important future duty for the aeroplane was to bring express services to those districts hitherto undeveloped by transport. In such places activities on the part of Luft Hansa could only be justified by industrial openings in the interest of Germany. They also wished to supplement the planned service by taxi and tramp flights.

Dealing with the question of subsidy for the air transport, Mr. Wronsky first examined a few characteristics of the German and English systems. In both cases the subsidy was based on the flight capacity—in England it was paid in proportion to the h.p.-miles flown, whereas in Germany the mileage basis, which varied according to the size and type of plane, served as the basis for calculation. They were now endeavouring to get the subsidy on the basis of a uniform ton-mileage basis.

Mr. Wronsky emphasized the fact that Imperial Airways, Ltd., was in a more favourable position than Luft Hansa, by having a subsidy guarantee contract with the Government for many years, this alone allowing a far-seeing transport, renewal and staff policy. Up to the spring of 1929, the air transport permit and also the obtainable subsidy amount was fixed annually in Germany, this creating a highly disadvantageous uncertainty in the working element. Only in 1929 the Government promised the German Luft Hansa a certain subsidy for a period of three years. Again, whereas in England and most other countries, the Governments acted as sole financial supporters, in Germany the conditions were more complicated, for not only the Government but also the various States, and even the towns, gave considerable amounts to the Luft Hansa for the expansion of the inner German air transport. The foreign transport, however, was solely subsidized by the Government.

Mr. Wronsky gave the following comparison of the air budgets of the various European countries. In 1929, they were:—Germany, £1,037,000; France, £14,300,000; England £16,200,000. Calculated per head per population, and taking into consideration the total expenses of the air service, including all charges for ground organisation, experiments, etc., the cost to the German nation per person was 1s. per annum; in France and England, owing to the additional expenses of the military air service, it was increased to several shillings per person. The actual amounts allowed by the Governments for air traffic were, in round figures:—England, £1,350,000; France, £1,400,000; Germany, £800,000.

Financial success depended upon expenses and receipts, the latter being governed by the tariff charges. The conditions existing to-day did not allow an increase in passenger or freight traffic charges, excepting in certain cases. It must be admitted that the aeroplane had not yet fulfilled all requirements as a transport service. Admittedly, it was speedy, but during the last few years no increase in speed had taken place. Although the reliability compared favourably with other transport services, the punctuality of the organised European services was between 95 per cent. and 97 per cent. The aeroplane lacked the comfort to which the travelling public was accustomed in other forms of transport, and which should be found also in long-distance aeroplanes.

Furthermore, it must not be forgotten that in the autumn and winter months services were unpunctual, and it frequently happened during the rush season that the demand for seats exceeded the supply, so that the aeroplane appeared to the modern traveller unreliable and frequently unavailable. We had, therefore, not yet attained perfection, and undoubtedly, insufficient progress had been made in recent years.

He added that, not only in Germany, but in a few other European countries, it had been noticed that practically no advance in passenger traffic took place during the last year—in some cases there had been a decrease.

What applied to passenger traffic also applied to an extent to post and cargo traffic. Without doubt the freight customer would be prepared to consign larger quantities by air routes and pay higher rates, if safety, punctuality, speed and constancy could be guaranteed, thus making it easier for him to give up the other transport systems.

The technical element also ruled the expense side. Neither the best organisation nor the most rational control could reduce expenses, if the aeroplane constantly showed such a great disproportion between total weight and serviceable weight, as was found today in all types, and to which must be added the high production and maintenance costs of the equipment and motors. Even today mass production of

modern traffic aeroplanes in Europe was impossible because a type had not been standardised and the justification had not yet arisen in any country.

Mr. Wronsky then gave a few examples regarding the expenditure on aerial traffic. A 10-seater, 3-engined transport aeroplane cost, roughly, RM. 200,000 (for all-metal, even RM. 300,000 or more). About 85 per cent. of the purchasing capital alone was required for aircraft.

The proportion of fixed to liquid expenses was about 55 per cent. to 45 per cent. Inside the fixed expenses which covered depreciation, insurance and fixed administrative expenses, depreciation and obsolescence were the first which appeared immediately as being specially high. Of the fixed expenses, depreciation and obsolescence represented approximately 50 per cent., and of the total expenses about 25 per cent. If it were possible to increase the life of the aeroplane and the motor, which was, roughly, 5 years and 4 years, respectively, it would result in a considerable reduction in the fixed expenses.

Insurance also formed a heavy charge on air transport. Including the "Kasko," accident and third-party risk, they amounted to, roughly, 10 per cent. of the total expenses. Here, also, with continued safety, an improvement must be looked for.

In this connection, Mr. Wronsky said that last year Luft Hansa introduced, as an experiment, an insurance system of their own for aeroplanes and motors, which so far had been very satisfactory.

The administrative charges were only 6 per cent. of the total fixed expenses—a large part of this amount being used in solving many development questions of a technical and political traffic nature, for which receipts could only be expected in the distant future.

Of the liquid expenses, the main item was the amount required for the preparation and maintenance of the aeroplanes and motors—about 22 per cent. of the total. Only by considerable technical progress would it be possible to reduce the amount required for preparation and maintenance. In any case, progress was noticeable here, as the Luft Hansa has, as an experiment, increased the working hours of the motors, between two overhauls, thereby showing a saving under this heading of 15 per cent.

Mr. Wronsky made special reference to the heavy expenses of the ground organisation, because the large staff and material of an aerodrome were often insufficiently utilised. Frequently the traffic in an aerodrome was confined to a few hours, during which large numbers of aeroplanes arrived and departed, requiring a large staff organisation without occupation at other hours of the day. The expenses on the ground organisation were increased, if the traffic in the winter months was reduced, or even cancelled entirely, as frequently happens. This explained that with a few air transport companies, especially Imperial Airways and the K.L.M., the balancing of the working expenses out of income was already possible up to 50 per cent. These companies maintained a very concentrated air traffic net, with few aerodromes. The Luft Hansa, whose route net was larger and more extensive, maintained more aerodromes in proportion. The balancing here of expenses out of income had not yet reached 40 per cent.

In connection with the effect of the traffic net on the working cost, Mr. Wronsky referred to the conclusions made by Professor Pirath, the Head of the Industrial Institute in Stuttgart. Pirath's conclusions were that the value of the aeroplane for transport for regular traffic appeared disadvantageous if it was only to work routes of at least 500 km. Short distances should only be used spasmodically. The best justifications for the air traffic, in his opinion, were only when the distance to be flown exceeded 1,000 km. He then arrived at three traffic stages; up to 500 km. spasmodic traffic, 500 to 1,000 km. national and international local traffic, over 1,000 km. international and intercontinental traffic. The third, the longest stage, was easily the most profitable, as due to the transport speed it was without competition from all other traffic, therefore, giving the best opportunity for obtaining higher tariff charges. The second stage could also have favourable results, if route management, aeroplane arrangement and traffic volume, etc., were well fitted into the requirements of the international traffic. The most unfavourable stage was the first (1 to 500 km.), the railways and the motor car being dangerous competitors.

Intermediate landings in the continental aerial traffic net should not (according to Pirath) occur more frequently than every 300 km., and then only in towns of 300,000 inhabitants or more.

Germany, having such a large number of well-populated towns and with heavy interest in the air traffic, such an idea

system could only be realised gradually. Where several large towns were close to each other, Pirath suggested creating a central aerodrome, serving all these towns.

Another conclusion of Pirath, namely, the reductions of the current expenses by increasing the service of a route have already been carried out by Luft Hansa, as on many main routes dual services are flown daily, and partly by giving the second service an alternative route, whilst Pirath's idea of a combined working of the traffic undertakings had been also, to a large extent, carried out by an agreement with the German State Railways, whereby every aerial passenger, if he could not start his aerial journey, or had to break same *en route*, was entitled to continue to his destination by express train (1st class), without additional charges.

The postal and freight traffic, during the last year, showed considerable increases. The Luft Hansa arranged in the spring of 1928, special rate tables from Berlin to London, and to Paris, with satisfactory results. The German post, last year, also temporarily arranged aerial postal routes from Berlin to London, Copenhagen and Stockholm, and contracted with the Luft Hansa for the whole working arrangements. For their short existence, these routes, which also handled freight consignments, claimed a remarkable success. Compared with 1928, the total weight consigned by these special freight routes had increased from 122,000 to 277,000 kg., and that of the post from 56,000 to 104,000 kg. Expressed in percentages this meant 126 per cent. increase in freight, and 86 per cent. increase in postal traffic. These routes are, therefore, to be further extended.

As a matter of interest, the German postal authorities did not pay on a km. basis, but, after the American principle, on the weight despatched. This was not a subsidy, the payments being far more for services fixed at a minimum amount, and thereby resembling an extra guarantee.

Next to the special postal routes, the German Luft Hansa worked its own freight routes to Paris, to the Rhein-Ruhr district, etc., these being well patronised. The freight service had worked in conjunction with the German railways efficiently; the latter taking over the handling and despatching of parcels from such places and on such railway routes as were untouched by the Luft Hansa. Every small German town was automatically linked to the aerial net, and every industrial concern had at its disposal the advantages of a speedy aerial service from the nearest aerodrome. For example, in 1929, the German railways handled aerial consignments from 287 places. As the Luft Hansa service only touched about 70 aerodromes, at least 210 of these places must be without aerodromes; theoretically therefore the traffic value of the service to the whole industry had been more than doubled. It was interesting to note that 90 per cent. of all consignments by railway and aeroplane were for export, and of these, 90 per cent. emanated from places without aerodromes. As the co-operation between railways and aeroplanes had proved advantageous for the goods traffic, it should become available to the industry of other European countries by a general adoption.

Mr. Wronsky emphasised the fact that no increase in the frequency of freight and postal traffic could have been made if preparations had not been made for the separation of passenger and goods traffic.

The passenger traffic flew to a fixed schedule during the day, postal and freight had different schedules. The increase in the freight traffic would hardly have been possible without the extension of the night routes from Berlin to the west. Past experience had shown that even the most favourable routes had very little postal traffic during the day. The newspaper postal service being an exception. Also, the parcel traffic inside Central Europe would not increase so long as night services could not be utilised. That actually in large circles of the industry the new traffic system was necessary was shown by the results of their postal and goods routes; for as soon as the time of departure was mainly transferred from day to night, the increase began. Without a doubt, the present freight routes only carried a part of the available traffic, and the creation of further routes to other industrial centres of Europe seemed to be only a question of time, or, rather of obtaining the necessary capital for the extension of the night service. It was certain that the extension of the night service and the postal and goods traffic were closely connected with one another. He, therefore, strongly supported the extension of the night service, and at first chiefly the Berlin-London and the Berlin-Paris routes. When the chain of beacon lights had been completed, they hoped, in conjunction with English and French traffic concerns to take up the postal goods exchange between London and Berlin, and Paris and Berlin, during the hours of 11 p.m. and 6 a.m. If by a regular service, letters were taken in one

night from Berlin to London or Paris, the public would be prepared to pay extra charges for such a speedy delivery. This would nearly cover the working expenses, requiring little subsidy support.

Mr. Wronsky added that shortly Luft Hansa anticipated organising a night service to Southern Europe. To the East, in the direction of Moscow, the night service had already been working successfully for two years. In 1928 their machines travelled on night routes over a quarter of a million km. The regularity in the summer months was nearly 97 per cent., being only about $\frac{1}{2}$ per cent. below that of the total traffic.

Regarding the question of safety, Mr. Wronsky said accidents would occur in every kind of traffic, but accidents in the air were taken by the public too seriously.

In the German Luft Hansa, from 1926 to 1928, the number of breakdowns, based on 1,000,000 flight km., dropped from 19.6 to 12.7. The total breakdowns between 1928 and 1929 had been reduced by 46 per cent. and the number of passengers hurt by 70 per cent. The proportion of casualties, in 1926, was 1 to 436,000 km. flown, in 1929 only 1 to 1,498,000 km.

Accidents had in nearly all cases either been due to defects of the working element, the motor, or to weather conditions.

More difficult to overcome were the weather conditions, in other words, the fog. To help here, experienced members of Luft Hansa staff were constantly working to find new instruments to increase safety, and on the perfection of the dashboard instruments of their aeroplanes. During the winter months—the slack season—extensive educational courses were arranged for the flying staff. For instance, at present a large proportion of the pilots were taught "blind flying." The pilots of seaplanes had lectures to prepare them for the examination in the "Great Flight," thus giving the staff experience in long distance land and sea service. By adopting the gyroscope and the directional wireless, night flying, and flying in fog had become much safer, giving better conditions for the regularity of the winter air service. Although, there was no comparison in the winter traffic with that of the months April to September, in Germany, compared with other years, they had achieved considerable encouraging working results. Thanks to taking up the night route Berlin-Hanover, the service with the West European centres could be maintained in the darkest months. All the before-mentioned improvements had considerably assisted in increasing the regularity.

Mr. Wronsky then returned to the co-operation of the Luft Hansa and the German Railways, giving examples of the arrangements now in use, and stated that he believed this co-ordinated railway-aeroplane service would become very serviceable in the next few years with the development of long-distance traffic. It also applied, he said, to steamships, and even the motor-car. He referred to the catapult air mail system from ocean-going lines carried out by Luft Hansa, in which they had, so far, succeeded in reducing the travelling time of the mail between New York and Berlin by about 30 to 36 hours.

In the North American traffic, for the time being, they intended to maintain this form of co-operation, whilst for increasing the speed of the overseas traffic to South America in conjunction with Spain and France, they intended to direct their aeroplanes via Marseilles-Seville to the Canary Islands, to deliver the post there and to collect as well. In both cases they had reached the first step towards an Atlantic air service, which later on would be carried out by aeroplane entirely. To this problem also full attention was being given, and they assumed that this could only be done by capable ocean flying-boats.

Under present conditions, and those of the near future, one should not be too optimistic about the possibilities of trans-oceanic passenger traffic, said Mr. Wronsky. The comfort in the aeroplane, even in five or ten years' time, due to the limited space, would not compare with the luxurious arrangements of ocean giants—a question which was more important with ocean journeys than with land, and would draw the wealthy travelling public first to the steamer. To him, therefore, it seemed more important to give attention to the building of capable freight and postal aeroplanes for the transatlantic traffic, and then to work for the passenger traffic. Considering that 80 per cent. of the total world trade crossed the Atlantic Ocean, he believed that his arguments could not be ignored. In Germany alone and its neighbouring states (Central Europe), the daily despatches of the letter-post for North America amounted to about 2,300 kg., for South America to about 500 kg., and for East Asia (Japan and China), 200 kg. In one year between Europe and Asia about 800 tons of letter-post were forwarded (according to Pirath). Add to this the very heavy freight service to these world

centres, the solvency, due to such quantities, would be much easier than the passenger traffic, even if only one-third was carried by the air service. To accomplish this, as already mentioned, an absolutely reliable, capable, and fast freight aeroplane, which they did not possess to-day anywhere, was necessary.

They also believed in the utility of the airship here, and hoped to work together with the Zeppelin Airship works during the coming year in opening the great aerial route to South America. In this co-ordination the large aeroplane would probably work from Central Europe to a port in South Spain; there the airship, whose wonderful feat had been acknowledged by the whole world, would receive the consignment, deliver same to the North East coast of South America, and hand over to the seaplanes of the Conder Syndicate which was allied to Luft Hansa. Furthermore, they contemplated a postal aerial service to the Far East. Several experimental flights, carried out to Peking and Irak,

had proved that the problem of working technical points, was solved. The difficulties here were more of a political character, as the aerial route crossed German, Russian and Chinese territories. In any case, he could say that the realisation of these two world traffic aims could only be achieved in a serviceable co-ordination with the older traffic means, and an objective co-operation of all interested Governments and traffic companies in the materialisation of these plans.

The aeroplane, concluded Mr. Wronsky, had already proved that, included in the general traffic arrangements, it could fulfil a high educational mission in the service of the international traffic and goods exchange. It was in their power to guide this young transport service to increased progress and to the opening of new traffic areas. Then it would not be "The Great Delusion" as an English writer called it, but a valuable addition to the other transport services, and so fulfil its great industrial and educational objective. To achieve this aim should be the main duty of all nations.



International Air Traffic Association

THE twenty-third session of the International Air Traffic Association was opened by Herr Carlberg, Chief of the Swedish Air Ministry, in the Riksdag Council Chamber, Stockholm, on March 14. Capt. Carl Florman, managing director of the Swedish Aero-Transport, read a memorandum on night flying in connection with air mail services at the final sitting on March 15. A resolution was carried requesting him to work out a detailed scheme of night air mail transport for presentation to the Association. Delegates expressed their belief that the night transport of mails was becoming increasingly necessary, and that international air mails might have to be confined very soon to night lines. The chief obstacle now, it was held, was the lack of illumination on landing grounds and the insufficiency of aerodromes. It was decided to approach all the Governments concerned and request the simultaneous application of summer-time to lessen the confusion of time-tables.

Melbourne-Adelaide Air Service

AUSTRALIAN AERIAL SERVICES, LTD. (Larkin Aircraft Supply Co., Ltd.), inaugurated a daily air service between Melbourne and Adelaide on March 14. The journey occupies five and a half hours.

Air Mails for China

AN agreement has been signed between the Chinese Minister of Communications and Deutsche Luft Hansa under which the latter is given the right to carry air mails from Germany to China via Siberia. A Chino-German company will be formed to operate in China.

French Flying Boat Catches Fire

A FRENCH flying boat belonging to the base at Bizerta caught fire in the air off that port on March 11. The pilot

succeeded in alighting in the sea, and five of the crew were saved by fishing boats, but the sixth was drowned.

R.A.F. Honorary Surgeon to the King

THE Air Ministry announces the appointment of Group-Capt. Henry Cooper, D.S.O., M.R.C.S., L.R.C.P., as an Honorary Surgeon to the King on relinquishment of this appointment by Air Vice-Marshal David Munro, C.B., C.I.E., M.B., Ch.B., F.R.C.S. (E.) (retired).

The Daniel Guggenheim Fund

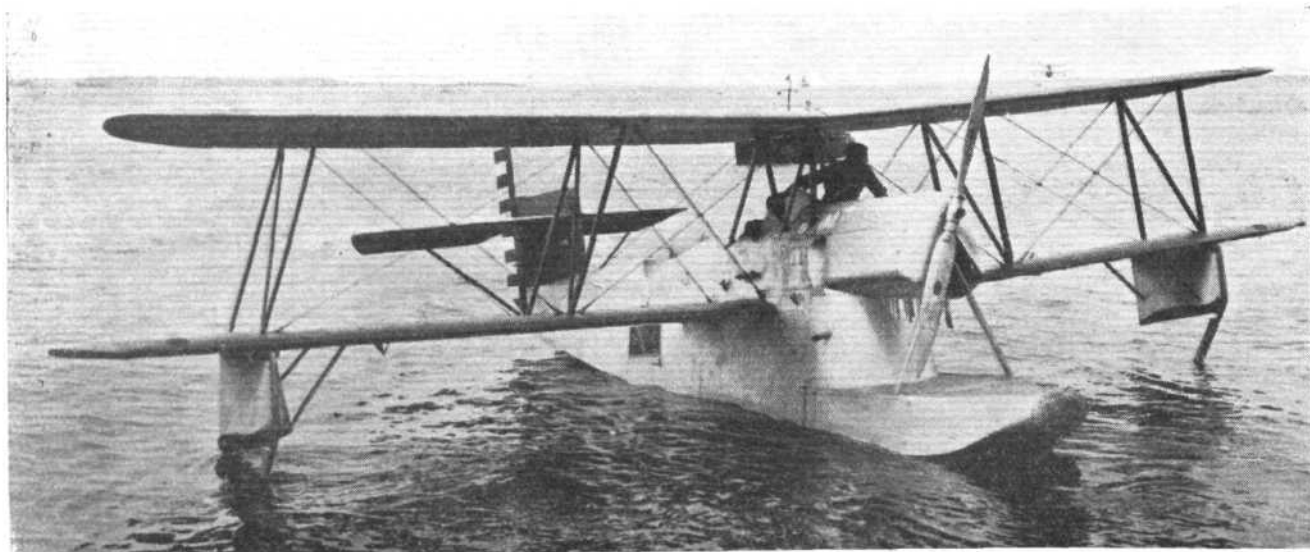
THE Daniel Guggenheim Fund for the Promotion of Aeronautics ceased to exist on February 1 last, after having accomplished the purpose for which it was founded in 1926 by Mr. Daniel Guggenheim. Mr. Harry F. Guggenheim, president of the Fund, is now serving as American Ambassador in Havana, Cuba.

Special Reserve and Auxiliary Air Forces

THE following is the programme of annual training camps for the Special Reserve and Auxiliary Air Force Squadrons:—

Auxiliary Air Force: No. 600 (City of London) Bomber Squadron, at Tangmere, near Chichester, August 3-17; No. 601 (County of London) Bomber Squadron, at Lympne, near Hythe, August 3-17; No. 602 (City of Glasgow) Bomber Squadron, at Leuchars, July 18-August 1; No. 603 (City of Edinburgh) Bomber Squadron, at Manston, near Ramsgate, July 13-27; No. 605 (County of Warwick) Bomber Squadron, at Manston, August 3-17.

Cadre Squadrons containing a Proportion of Special Reserve Personnel: No. 501 (City of Bristol) Bomber Squadron, at Filton, July 27 to August 9; No. 502 (Ulster) Bomber Squadron, at Aldergrove, July 13 to 22; No. 503 (County of Lincoln) Bomber Squadron, at Tangmere, July 20 to August 2; No. 504 (County of Nottingham) Bomber Squadron, at Eastchurch, first two weeks of August.



A SINGLE-WHEEL AMPHIBIAN: The Loening XO-10 is a two-seater experimental observation plane, fitted with Wright "Typhoon" engine. A three-lens camera is installed in the bottom, the opening being covered with a watertight cover when the machine is used on the sea. The inverted vee-type air-cooled engine is an interesting experiment.

AIRISMS FROM THE FOUR WINDS

The Flight to Australia

WE are glad to be able to state that the report, referred to in last week's issue of FLIGHT, that Flying Officers H. L. Piper and C. Kay—who are flying to Australia in a Desoutter cabin monoplane ("Cirrus Hermes")—were missing is unfounded. We understand from Desoutter Aircraft Co., Ltd., that the airmen had engine trouble at Akyab, which, after some delay, has been rectified, and that they were expected to resume their journey on March 16.

Mr. Van Lear Black

MR. VAN LEAR BLACK, who is flying to the East in his Fokker monoplane, after a day's stop at Akyab, left for Burma on March 13. His pilots are Mr. Geysendorffer and Mr. Scholte, who have piloted him on previous occasions.

India-England Flight

MR. R. N. CHAWLA, the Indian pilot and member of the Karachi Aero-Club, who is flying from Karachi to England in a D.H. "Moth," arrived at Marignane, Marseilles, on March 17.

Duchess of Bedford's Next Flight

It is reported that the Duchess of Bedford is planning a flight to Cape Town and back, piloted by Capt. C. D. Barnard.

World's Altitude Record for Women Pilots

ON March 10, Miss Elinor Smith, the 18-year-old American air-woman, is reported to have beaten the world's altitude record for women pilots by attaining a height of over 30,000 ft. At this altitude she lost consciousness, and did not regain control of the machine, which was in a dive, until it had fallen to 24,000 ft.; she made a successful landing, however.

The Prince Flies Again

THE Prince of Wales flew over Entebbe and Kampala, on March 11, in one of the South African Air Force machines now returning from Cairo to Cape Town.

Miss O'Brien's Aerial Campaign

MISS SICELE O'BRIEN, who lost her leg in a crash and has now regained her pilot's licence, is to conduct a "Buy British Goods" campaign with a series of "flying lectures," on the Empire and its products by means of an Imperial Airways machine, which she will fly around the country. After each lecture, Miss O'Brien will give joy rides to members of the audience.

Swedish Pilot's African Flight

AN interesting letter has been received by Cirrus Aero-Engines, Ltd., from Capt. Gosta Andree, the well-known Swedish pilot who recently flew from Sweden to Cape Town on his "Cirrus II Moth," and who is now on his way back. At present he is delayed at Benghazi, and says in his letter the reason for his delay is that on December 13 he left Benghazi

and on the way he noticed, about 1 kilometre from the coast, a very nice sandy ground, which he thought would be suitable for landing. After he had been flying for about 20 minutes, he went into a very bad storm, worse than any he had previously experienced, and rather than take any undue risk, he returned to this sandy ground and landed to wait until the storm had passed. Instead of getting better, however, the weather turned worse, and Captain Andree therefore decided to stay the night. About 1 a.m. or 2 a.m. in the morning a most dreadful gale broke out, and Captain Andree had to hand on to the wing all night to prevent the machine being blown over. He goes on to say that the next day a thing happened that had never occurred once in hundreds of years, the sea broke over the edge of the sand dunes and flooded his temporary aerodrome, and in ten minutes the machine was in water over the bottom wings. He then had to walk three days into the desert without food, and it was only fifteen days later that he was able to extract the machine from the water. The only damage that the engine had sustained was to the magneto armatures, and to make doubly certain of everything being all right, he changed to a new propeller.

Lockheed Test for High Commercial Flying

A STANDARD Lockheed Express model has been used for carrying out tests, with a disposable load of 2,130 lb., at an altitude of 25,000 ft. in order to determine exactly the efficiency of this model at high altitudes, so that this data might be sent to the airline companies whose routes, which now necessitate flying around the high peaks, can be shortened by flying over the latter; and also to find out the exact manoeuvrability of the machine at these high altitudes. Further tests will be carried out by Col. Lindbergh in his Lockheed "Sirrus."

Looking Ahead

A LARGE expanse of flat roof has been formed on the huge new block of flats that has just been erected by the Prudential Assurance Co., Ltd., at Portman Square, W., which, when the time comes, can be used as a landing ground for aircraft!

Canadian Air Mail Accident

A MACHINE operating on the Toronto-Montreal air mail service crashed on the shore of Long Lake, Ont., on March 18, and the pilot, H. Simoneau, and the wireless operator, P. Robinson, were killed.

U.S. Air Mail and Machines Destroyed

A SERIOUS fire occurred at Hadley Field aerodrome, New Jersey, as a result of which 18 aircraft, valued at £35,000, and several bags of air mail have been destroyed.



A NEW TROOP CARRIER: The Handley Page "Olive" is fitted with Bristol geared "Jupiter" engines, automatic slots and other things. (FLIGHT Photo.)

CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

THE CHRISTMAS MONOPLANE

[2288] Among us on this side who are interested in aviation, your magazine has a reputation for fairness in editorial comment and criticism which we find actuated by honesty of purpose and in accordance with ethics. For these reasons I venture to address you in regard to a matter which has been forced upon the public attention in a false and scurrilous way by one of your contemporaries.

In an issue of one of your British contemporaries some injurious and libellous statements were published in relation to the General Development Company of Connecticut, and its Vice-President, Dr. William Whitney Christmas, intimating that these were based on information received from the *New York Times*. These statements were not only indirectly false, but directly false, from beginning to end. As soon as we had observed these matters, I had them taken up with the *New York Times*, and as a result, I have before me two letters, one from Louis Wiley, Business Manager, making the following statement:—

"The examination of the *Times*' files, I am informed, shows no news printed which could have been the basis for such statements as are made in the British magazine you sent."

And the other from F. T. Birchall, Acting Managing Editor of the *Times*, stating that they are investigating the matter, and upon receipt of further information, they will consider what action would be best to take. In other words, the *Times* has repudiated the fabrication, and I have no doubt they will take proper steps to do justice to themselves as well as us.

May I say that the General Development Company, of Connecticut, is a corporation composed of men whose business characters are beyond reproach. As their patent counsel, and after thirty years of experience, I can say that they are engaged upon a work of the most laudable and constructive character, and I firmly believe they are doing a wonderful service for the benefit and advancement of humanity. It is the general sentiment among those who best know world conditions, that what is most needed at the present time is a tonnage carrier in the air. Dr. Christmas has produced this, without question, and not only are his concepts sound, as proved by wind tunnel test, but these planes, which are being developed, have behind them the best engineering force that could be assembled. The General Development Company of Connecticut has gotten together a large number of men of the highest engineering reputation, both foreign and American, to work out its problems, and in addition has had the work checked and double checked by disinterested outside engineering authorities, the best that can be found. When the company, or its own experts, have been in the slightest degree dubious about the solution of its own problems, the best advice that could be obtained has always been brought into the discussion. As a result, we are in possession of practically finished designs for a tonnage carrier of the air that we believe to be superior to anything proposed up to this time. Please note that all of this work up to date has been financed through the General Development Company of Connecticut, by a small group of gentlemen in Hartford who projected the company, no stock having been sold to the public, and the whole proposition being entirely clean. If any stock is offered the public it will be on a strictly business basis, and in accordance with ethical rules.

Some of the criticism was directed against Dr. Christmas. This gentleman has been studying the science of aeronautics since 1890, and judging from actual results, his associates believe he is more advanced in the study of bird flight than any other man. His actual building of aeroplanes began as early as 1907, and he is the inventor and patentee of the inset aileron, which, of course, is used by practically every aeroplane in the world, and many other inventions well known to the aeronautical world. Dr. Christmas is a man of the highest integrity, sincere in his work, and very fortunately able to see into the future without being discouraged by criticism. I believe that Dr. Christmas, with the assistance of his engineers, has produced the first practical solution of the problem of tonnage carrying in the air, which, of course, means real commercial air transportation. What this may mean to the world if generally adopted it is difficult to estimate, and instead of condemnation, he should receive encouragement and approval of his brothers in the art, who

above all men know the pains and hard work involved in the production of any real improvement.

In closing, may I refer to another allusion in the article to Dr. Christmas' bullet 'plane killing a pilot. These are the facts as they came to me from a witness: Mr. Mills, the pilot in question, flew the Christmas bullet plane in December, 1918, and I am informed it made 222 miles per hour with only a 200 h.p. engine carrying the weight of the 'plane and pilot, which was 2,700 lb. I am informed that this flexible wing type of 'plane still has the record for fast flight, with a comparatively low-powered engine and excessive weight per h.p., and you have probably noted that flexible wing development is now going on and will probably affect the designs of the aeroplane of the future.

Mr. Mills was killed by striking a tree while flying this 'plane. He was flying very low over the trees, and a large white oak tree very much above the surrounding forest was in his line of flight, but he evidently did not see it until too late, owing to his very high rate of speed. This, of course, was no fault of the machine, and I am informed that before the accident Mr. Mills had flown it more than seven times and had pronounced it a wonderful machine.

The names of witnesses and photographs of this machine in flight are available if you would like to have them and I trust you will give publication to the facts stated herein, if you can consistently do so, for the purpose of righting a cruel and gratuitous wrong directed against the General Development Company of Connecticut and Dr. William Whitney Christmas, as well as their associates. From those whom we know are honest we have no secrets, and on any proper occasion, if you wish to discuss with us the inventions which form the foundation of our business, our patent situation, our financial structure, and the personnel and policies of our engineering and business organizations, we should be glad to do so.

EDWARD E. CLEMENT,
Patent Counsel for Dr. William
Whitney Christmas, and General
Development Co., of Connecticut.

THE RED KNIGHT OF GERMANY

[2289] In your review of the book "The Red Knight of Germany," by Floyd Gibbons, you mention that Baron Manfred Von Richtofen was shot down twice. I would like to point out that according to a letter of his published in that book, there was a third occasion, namely, on January 24, 1917.

To quote from that letter: "As I settled with the latter" (his eighteenth victory), "one of my wings broke at 900 ft. altitude, and it was nothing short of a miracle that I reached the ground without mishap." He also mentions it in his official report. Evidently, a bullet fired by Lieut. J. E. MacLennan nearly ended his career.

Mr. Gibbons' account of that fight is far from being correct in detail.

O. GREIG,
Captain.

Okehampton, Devon.
March 15, 1930.

AIR ACCIDENTS

[2290] With reference to Mr. G. D. Everington's letter, No. 2281, suggesting having tanks which could be made to drop off the aeroplane at the will of the pilot, it would be extremely dangerous to people on the ground. Would it not improve the idea to have a parachute folded behind the tank and attached to it, which could be released by the pilot? It would draw off the tank and bear it slowly to earth. In thick wing monoplanes where the tank is inside the wing, the back of the tank could taper off to a point resting on top of the rear spar, letting the top of it follow the camber of the wing and having no covering. On the parachute being released it would slide the tank over the rear spar.

I also agree with the *Morning Post's* correspondent who dislikes the word "airplane," but the B.B.C. is not the only offender. One newspaper never fails to omit the "o" (and consequently change the "e" to "i"). The Sunday before last, under a photo was printed "The Model Airplane Club,"

referring to the meeting on Wimbledon Common. They surely do not own this name. In various telegrams sent from airmen, when printed word for word, "airplane" has been used. No doubt, the paper "corrected" the word that they used. But is not "aeroplane" English and "airplane" American? I have noticed that invariably English books and papers on the subject keep the "o," and American books omit it. Does "the fount of English undefiled" use an Americanism, then?

It seems as if a few people disinterested in aircraft wish to change the correct and original word, and not let airmen have any say in the matter. The airmen should obviously have the choice.

Streatham, S.W.16.

GLIDING CLUBS—A SUGGESTION

[2291]. If the Treaty of Versailles has done no other good in the world than to create the German gliding clubs then it was well worth while. I think that the ten years' record given by Drs. Georgii and Stainer in their recent lecture before the Aeronautical Society is one of the most important contributions to the history of man flight. The glide by Kronfeld for Wasser-Kuppe to Bayreuth of 150 km. should inspire the "air-minded" youth of every civilised country; the diagram which you publish on page 279 of your issue of March 7, showing his spiral ascent through a cloud to gain initial height, his subsequent use of other clouds to main elevation and the flat spirals by which he finally concluded this record glide, that diagram, I contend, is an historic document and should be hung in a frame in every flying club.

Further, I think that the motor-cycling clubs of this country which now have no more hills to conquer and whose ground speeds have reached uncomfortable limits would welcome information whereby they could take up gliding. Germany certainly has no monopoly of "air-minded" youths and I am sure that under the same Treaty restrictions as produced the German "bird men" we should have done equally well if not better.

The material is there and all that is needed is the necessary incentive to develop it.

N. D. N.

May I suggest that there is now an excellent opportunity for a combination of the flying, motor-cycling and speed-boat interests in this country to promote still further the art and sport of gliding?

Yours faithfully,
W. E. WARRILOW.

Oxhey, Herts.
March 14, 1930.

MAPS FOR GLIDING

[2292]. With reference to Dr. Georgii's lecture recently reported in your column and the revived interest in gliding in this country, may I make a suggestion which would, I think, facilitate cross-country gliding. The progress which has been made in Germany indicates that extended gliders are likely to be soon common over here.

It might be possible to persuade a cartographer in conjunction with the Air Ministry and Meteorological Office to prepare anemographic maps of districts suitable for gliding, such as the Chilterns or North and South Downs.

The maps could at first be prepared showing up currents in the prevailing wind.

If there were sufficient demand for these, they might be elaborated and issued in series for a given gliding area showing the up currents in winds from other quarters.

The up currents could be hachured in colours in a similar manner to that employed to indicate view-points on ordinary touring maps.

Provided with a series of these covering his proposed course, the experienced glider would be enabled, in suitable winds, to pick his way from hill to hill and range to range in cross-country journeys.

A cheap alternative, of course, would be the use of large-scale Ordnance maps, which could be charted for air currents by gliding clubs as the result of experience in their gliding areas. As clubs multiplied these anemographic maps could be exchanged by clubs, and thus gradually the whole area of the country could be charted for gliding purposes.

W. G. C. GUNDRY.

Crewkerne, Somerset.
March 17, 1930.



That "I've got my 'A' Certificate feeling."

THE ROYAL AIR FORCE



London Gazette, March 4, 1930

General Duties Branch

The follg. are granted short service commns. as Pilot Officers on probation with effect from and with seniority of Feb. 21 :—F. G. L. Bain, G. S. Barrett, L. T. G. Barber, J. H. Bell, W. J. Brighty, H. G. Burgess, H. T. Clark, R. C. H. Crosthwaite, H. I. Dabinett, E. S. Ennals, G. A. C. Foster, D. McC. Gordon, J. A. Hankins, P. G. Harton, N. C. Hendrikz, M. H. Kelly, E. G. B. Kiddle, R. L. Kippenberger, C. A. M. Kyrke-Smith, the Hon. Ferdinand D. H. Lea Smith, R. W. G. Love (Sec. Lt. 1st R.U.Rif. Supplementary Reserve), J. G. Nolan, H. C. O'Loughlin, J. R. Palmer, M. P. Price, R. Ruston, R. C. Stuckes, J. H. Supple, M. S. Thompson, R. B. Wardman, J. R. Watson (Sec. Lt., 57th Med. (Lowland) Brig., R.A.).

The follg. are promoted with effect from March 5 :—*Flights Lieutenants to be Squadron Leaders*.—G. E. Gibbs, M.C., W. B. Everton, I. Cullen; M.B.E., A.F.C., C. F. Horsley, M.C. J. J. Williamson, A.F.C., G. H. Martingell, A.F.C., R. Harrison, D.F.C., A. L. Fiddament, D.F.C., J. R. Cassidy, S. B. Harris, D.F.C., A.F.C. *Flying Officers to be Flight Lieutenants*.—J. H. McN. Campbell, W. T. Holmes, W. E. Symonds, C. Feather, H. E. Nowell, S. H. Hardy, P. S. Blockey, J. A. T. Ryde, F. M. Denny, L. R. W. Tizzard, G. D. Middleton.

The follg. Pilot Officers are promoted to rank of Flying Officer :—A. Haywood (Sept. 2, 1929); H. T. Lines, C. N. McLoughlin, R. F. Williams (Jan. 14); J. T. Stephenson, R. J. Cooper, L. F. Sinclair, A. L. Franks (Jan. 28).

Wing Commander F. P. Don is placed on half pay list, Scale B (Feb. 27, 1930, to March 29, 1930 inclusive); the short service commn. of Pilot Officer on probation G. D. Seabourn is terminated on cessation of duty (Jan. 16).

Stores Branch

Pilot Officer on probation W. J. B. Elliott is confirmed in rank and promoted to rank of Flying Officer (Jan. 10).

Medical Branch

The follg. Flight Lieutenants are granted permanent commns. in this rank (March 5).—A. L. St. A. McClosky, M.R.C.S., L.R.C.P., J. M. Ritchie, M.B., Ch.B., B. B. Kennedy, M.B., Ch.B.

Air Vice-Marshal David Munro, C.B., C.I.E., M.B., Ch.B., F.R.C.S. (E.), Honorary Surgeon to the King, is placed on the retired list at his own request (March 1). Flight-Lt. J. R. Williams, L.D.S. (Temp. Capt., General List, Army, Dental Surgeon), relinquishes his temp. commn. in the R.A.F. on completion of service (Feb. 16).

Memoranda

The permission granted to Sec. Lt. H. A. Hughes to retain his rank is withdrawn on his conviction by the Civil Power (Jan. 6).

The permission granted to the follg. Sec. Lieutenants to retain rank is

ROYAL AIR FORCE INTELLIGENCE

Appointments—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Group Captain : L. A. Pattinson, D.S.O., M.C., D.F.C., to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 29.1.30.

Wing Commanders : E. Osmond, C.B.E., to R.A.F. Practice Camp, North Coates Fitties, to command, 8.3.30. G. G. H. Cooke, D.S.C., A.F.C., to Home Aircraft Depot, Henlow, for Administrative duties, 5.2.30. C. H. Nicholas, D.F.C., A.F.C., to H.Q., R.A.F., India, for Air Staff duties, 20.1.30.

Wing Commanders : D. L. Allen, A.F.C., to R.A.F. Practice Camp, Sutton Bridge, to command, 8.3.30. A. Gray, M.C., to H.Q., R.A.F., India, for Engineer Staff Duties, 9.2.30.

Squadron Leaders : H. I. Hammer, D.F.C., to No. 504 Sqdn., Hucknall, 10.2.30. L. G. S. Payne, M.C., A.F.C., to No. 7 Sqdn., Worthy Down, 21.2.30. V. Buxton, O.B.E., to Armament and Gunnery Sch., Eastchurch, 14.2.30. O. G. W. G. Lywood, O.B.E., to H.Q., Coastal Area, 17.2.30. E. R. Whitehouse, to Elec. and Wireless Sch., Cranwell, 16.2.30. H. G. Lowe, M.C., to Air Ministry (D.O.S.D.), 1.2.30. R. H. Kershaw, to No. 202 Sqdn., Malta, 28.1.30. R. C. Hardstaff, to H.Q., Iraq Command, 21.1.30. A. H. Stradling, O.B.E., to No. 1 Flying Training Sch., Netheravon, 17.2.30. J. W. Woodhouse, D.S.O., M.C., to No. 55 Sqdn., Iraq, 24.1.30. J. G. S. Cady, D.F.C., to Air Ministry (D. of E.), 20.3.30.

Squadron Leaders : E. A. Stevens, M.C., to R.A.F. Depot, Uxbridge, 29.1.30. O. G. W. G. Lywood, O.B.E., to Air Ministry D.O.S.D., 26.2.30. J. H. Simpson, to Electrical and Wireless School, Cranwell, 26.2.30.

Flight Lieutenants : E. T. Carpenter, A.F.C., to Station H.Q., Tangmere, 17.2.30. V. H. Tait, to H.Q., R.A.F., Middle East, 11.2.30. J. Glover, to No. 2 Armoured Car Co., Palestine, 11.2.30. G. H. Stainforth, to H.Q., Fighting Area, Uxbridge, 17.2.30. F. C. T. Rowe, to No. 1 Sch. of Tech. Training (Apprentices), Halton, 10.2.30. J. H. Winch, to Home Aircraft Depot, Henlow, 18.2.30. E. R. C. Hobson, D.F.C., to Air Ministry (D.O.I.), 10.2.30. H. G. Rowe, D.F.C., to Station H.Q., Heliopolis, 21.1.30. F. J. Fogarty, D.F.C., to No. 601 Sqdn., Hendon, 3.3.30. C. H. A. Stevens, to H.Q., Coastal Area, 24.2.30. O. W. McK. Thompson, to Aeroplane and

withdrawn on their enlistment in the Supplementary Reserve :—C. H. B. Stevenson (Jan. 8); J. M. F. MacDonald (Feb. 10).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

F. Ingham is granted a commn. in Class B.B. as a Pilot Officer on probation (March 4). The follg. Pilot Officers are promoted to rank of Flying Officer (March 3) :—D. H. Duder and R. F. G. Lea. Flying Officer C. H. G. Bremridge relinquishes his commn. on appointment to a commn. in the Royal Canadian Air Force (Dec. 16, 1929).

London Gazette, March 11, 1930.

Air Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., is appointed Principal Air Aide-de-Camp to the King (February 27) (vice Air Chief Marshal Sir J. M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O.).

General Duties Branch

The following Pilot Officers are promoted to rank of Flying Officer :—E. L. Mole (July 14, 1929); T. R. Hope (January 14); R. B. Councell, J. A. C. Stratton, E. J. Laine (January 28). Flying Officer H. T. Andrews is transferred to Reserve Class A (March 1); Lieut. O. C. Jones, R.M., Flying Officer, R.A.F., ceases to be attached to R.A.F. on return to duty with Royal Marines (March 1).

Medical Branch

Air Commodore J. McIntyre, M.C., M.B., B.Ch., is appointed Director of Medical Services, Air Ministry (March 1); Flight-Lieut. R. Thorpe, M.R.C.S., L.R.C.P., is granted a permanent commn. in this rank (March 12); Flight-Lieut. (Quartermaster) W. P. Conolly is promoted to rank of Sqdn.-Ldr. (February 21); Flying Officer P. B. L. Potter, M.B., Ch.B., is promoted to rank of Flight Lieut. (March 5); Maj. A. A. McMullan, L.D.S., R.F.P.S. (G) (Army Dental Corps) is granted a temp. commn. as Sqdn.-Ldr. (Dental) on attachment to R.A.F. (February 21); Flight-Lieut. S. A. McCormack, L.D.S. (Capt., Army Dental Corps), relinquishes his temp. commn. on return to Army duty (February 21).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

A Dewsbury is granted a commission in Class B as a Pilot Officer on probation (March 4); J. B. Harvey is granted a commn. in Class C as a Flying Officer (March 4). The follg. Flying Officers of the Special Reserve are promoted to rank of Flight-Lieut. (March 11) :—D. G. Allison, T. H. Worth. The follg. are transferred from Class A to Class C :—Flight-Lieut. L. R. L. Brown, D.F.C. (March 6); Flying Officer L. A. Lewis (February 20); Flying Officer A. J. Thompson (March 4).

Armament Experimental Estab., Martlesham Heath, 24.2.30. A. H. Beach, to No. 4 Flying Training Sch., Middle East, 21.2.30. J. C. Belford, to No. 2 Armoured Car Co., Palestine, 21.2.30.

Flight Lieutenants : (Hon. S/Ldr.) V. M. Kenny-Leveck, M.B.E., to R.A.F. Depot, Uxbridge, 18.1.30. J. F. A. Day, A.F.C., to R.A.F. Depot, Uxbridge, 9.2.30. W. Catchpole, A.F.C., to No. 1 Sch. of Tech. Training (Apprentices), Halton, 24.2.30. F. G. S. Mitchell, to Air Ministry (D. of T.), 1.2.30. C. F. Sealy, to Armament and Gunnery Sch., Eastchurch, 9.2.30.

Flying Officers : E. T. Kingsford, to No. 4 Flying Training Sch., Middle East, 21.2.30. H. V. Smith, D.C.M., to R.A.F. Depot, Uxbridge, 17.1.30. L. C. Bennett, to No. 4 Flying Training Sch., Middle East, 11.2.30. E. C. T. Edwards, to No. 600 Sqdn., Hendon, 14.2.30. R. O. Wilson, to No. 47 Sqdn., Middle East, 5.2.30. J. N. Young, to R.A.F. Depot, Uxbridge, 7.1.30.

Pilot Officers : The undermentioned are all posted to No. 4 Flying Training School, Middle East, with effect from 21.2.30 :—R. V. Alexander, N. H. Bantoft, J. Boston, H. M. Bowes-Lyon, H. F. Clayton-Daubeny, E. J. P. Davy, W. G. Eatherley, B. E. Lowe, T. J. Macinerney, J. G. Mansfield, P. W. E. Ryland, U. Y. Shannon, R. M. Smith, J. B. T. Whitehead.

Flying Officers : T. B. Byrne, to No. 54 Sqdn., Hornchurch, 20.2.30. H. L. Patch, to Armament and Gunnery Sch., Eastchurch, 9.2.30. E. J. H. F. Moreton, to R.A.F. Depot, Uxbridge, 18.1.30. U. S. Mackay, to No. 55 Sqdn., Iraq, 5.2.30.

Pilot Officers : G. F. Alexander, to No. 503 Sqdn., Waddington, 9.2.30. S. H. Turner, to No. 503 Sqdn., Waddington, 9.2.30; C. M. D. Chambers, to No. 54 Sqdn., Hornchurch, 25.1.30. The undermentioned are all posted to R.A.F. Depot, Uxbridge, on appointment to Short Service Commns., on probation, with effect from 21.2.30 :—F. G. L. Bain, L. T. G. Barber, G. S. Barrett, J. H. Bell, W. J. Brighty, H. G. Burgess, H. T. Clark, R. C. H. Crosthwaite, H. I. Dabinett, E. S. Ennals, G. A. C. Foster, D. McC. Gordon, J. A. Hankins, P. G. Harton, N. C. Hendrik, M. H. Kelly, E. G. B. Kiddle, R. L. Kippenberger, C. A. M. Kyrke-Smith, Hon. F. D. H. Lea-Smith, R. W. G. Love, J. G. Nolan, H. C. O'Loughlin, J. R. Palmer, M. P. Price, R. Ruston, R. C. Stuckes, J. H. Supple, M. S. Thompson, R. B. Wardman, and J. R. Watson.

R.A.F. SPORT

Rugby Football

R.A.F. v. CIVIL SERVICE.—The Civil Service beat the R.A.F. at Halton on Friday, March 14, by one goal and two tries (11 points) to one penalty goal and one try (6 points). It was a poor game, of a scramble nature, in which neither side played really sound Rugby. The Civil Service won because it was the less bad team of the two. The one try gained for the Air Force was the result of a breakaway by Sergt. Hall, which ended in Aircraftman Gigg getting over the line. At the very end of the game F/O. Llewellyn kicked a penalty goal. The Civil Services tries were scored by Ashwell (two) and Vaughan. The teams were :—

Royal Air Force.—Pilot Officer G. M. Ievers, back; Pilot Officer G. R. White, Flying Officer Pott, Pilot Officer Slocum, and Flying Officer R. D. Cotton, three-quarter backs; Flying Officer Llewellyn and Pilot Officer Elsmie, half-backs; Flight-Sergt. Kerly, Flight-Lieut. G. R. Beamish, Pilot Officer McKechnie, Flying Officer Beaumont, Flying Officer Constantine, Pilot Officer G. S. Williams, Aircraftman Gibbs, and Sergeant Hall, forwards.

Civil Service.—R. Warne, back; P. A. Gummer, A. G. Lewis, G. Golds-worthy, and L. G. Ashwell, three-quarter backs; J. E. Richards and J. T. Davies, half-backs; R. H. Sparkes, L. Beer, W. Trounce, A. H. Walker, W. Shepperd, S. C. Tucker, H. R. Wright and J. Vaughan, forwards.

Association Football

R.A.F. v. ARMY.—The R.A.F. XI beat the Army XI at Plough Lane, Wimbledon, on Saturday, March 15 by four goals to two. The airmen proved to be the more experienced and polished side. All their lines played well. Parrish scored the first two goals for the R.A.F. Then Henderson got one for the Army, but Kelly added another score for the airmen before half time. In the second half Vernon scored once, and put the ball through again, but had the goal disallowed because another player was offside. Just before the close Allen scored a very good goal for the Army. L.A./C. James and A./C. Vernon were both injured, but it is hoped that both will be able to play against the Navy. The teams were :—

Royal Air Force.—L.A./C. Chaston (Uxbridge); Corpl. Pond (Henlow), L.A./C. James (Netheravon); Corpl. Baldwin (West Drayton), Corpl. Robinson (Henlow), A/C. Armstrong (Eastchurch); A. Parrish (Kenley), A/C. Kelly (Henlow), L. Vernon (Halton), Sergt. Acquaroff (Worthydown) and A/C. Hickey, Uxbridge.

The Army.—Musician R. V. Dunn (Royal Horse Guards); Rifleman A. Weatherhead (The Rifle Brigade), Lce.-Corpl. B. England (King's Shropshire L.I.); Lieut. T. M. R. Briggs (R.A.S.C.), Pte. E. D. Gerrard (Royal Tank Corps), Pte. G. King (King's Own Royal Regt.); Sergt. J. McGowan (King's Own Scottish Borderers), Lce.-Sergt. P. Henderson (Royal Engineers), Pte. J. Dexter (Wiltshire Regt.), Lce.-Corpl. R. Marsden (The Buffs), and Corpl. D. Allen (Sherwood Foresters).

IN PARLIAMENT

Airship "R 100"

MR. MONTAGUE, on March 12, in reply to Mr. D. G. Somerville, said no arrangements for commercial flights by R 100 have yet been considered, but it is expected that she will make an experimental flight to Canada towards the end of May.

R.A.F. High-Speed Flight

MR. MONTAGUE, in reply to Mr. Granville, said it is not contemplated at present that the high-speed flight will be reconstituted. High-speed research is, however, being continued, and two officers (one trained and one under training) are to be appointed for this purpose to Felixstowe. The selection of pilots would not be restricted to unmarried officers and men.

AIR MINISTRY NOTICE TO AIRMEN

Italy: Rome (Vatican City) Prohibited Area: Viareggio and Furbara Danger Areas

1. Rome (Vatican City) Prohibited Area—

Flight over the Vatican City and its immediate vicinity is prohibited within the following boundary.

Straight lines joining S. Pietro railway station, Castel S. Angelo, Vittorio Emanuele Barracks, Piazzale degli Eroi, Fornace Vieschi (Foundries) and S. Pietro railway station.

2. Viareggio Artillery Range—

Flight over the following area is dangerous and should be avoided:—

An approximately rectangular sea and land area, situated along the coast between Viareggio and the mouth of the River Arno, and extending 5 km. seaward from the coast, and 2 km. inland. The area between Viareggio and Torre del Lago (5 km. S.E. by S. of Viareggio) is particularly dangerous.

3. Furbara Air Gunnery and Bombing Range—

Flight over the following area is dangerous and should be avoided when firing, etc., is in progress—

A land area situated on the coast between the Rome-Civitavecchia coast road and the sea, and extending from the N.W. side of Furbara aerodrome to Castello di S. Severa (5.25 km.) W.N.W. or Furbara railway station).

A red flag is displayed on the radio aerial at Furbara aerodrome when firing, etc., is in progress.

4. NOTA BENE.—It should be noted that these areas are additional to those published in Nos. 52, 54 and 55 of the Monthly Supplements to *The Air Pilot* (1924 Edition).

General Notice. (No. 8 of 1930.)

PERSONAL

Married

Wing-Commander FRANCIS P. DON, third son of the late Mr. Robert B. Don, of The Lodge, Broughty Ferry, was married on March 11, at North Elmham Church, Norfolk, to Miss ANGELA JANE BIRKBECK, only daughter of the late Mr. Edward L. Birkbeck and of Mrs. Edward Birkbeck, of Elmham House, Norfolk.

THE ROYAL AIR FORCE MEMORIAL FUND

The usual meeting of the Grants Sub-Committee of the Fund was held at Idlesleigh House, on March 13. Mr. W. S. Field was in the chair, and the other members of the committee present were:—Mrs. L. M. K. Pratt-Barlow, O.B.E., Lieut.-Comdr. H. E. Perrin, Air Commodore B. C. H. Drew, Squadron-Leader A. H. Wann. The committee considered in all 15 cases, and made grants to the amount of £176 18s. 6d.

Harrogate Aircraft Club (Model Section)

A FLYING meeting will be held on Saturday, April 5, at 3 p.m., weather permitting (place to be notified later). This competition is open to all who are desirous of competing, whether members of the Aircraft Club or not. Prizes will be awarded for models remaining in the air for the longest time, the best of three attempts to count.

All entries and enquiries in connection with this competition to be sent to Mr. R. W. Johnson, Astra House, West End Avenue, Harrogate. Entries must be in by Thursday, March 27.

No prize will be awarded in any class unless there are three or more starters in that class. The class in which a model shall fly will be decided by the judges. Entries must be accompanied by an entrance fee for each model of one shilling, 50 per cent. of which will be returned to starters. Late entries up to Thursday, April 3, at a special late fee of 2s. 6d.

Photographs of the "Moth Six"

IN the caption to the photographs published on p. 291 in last week's issue, we stated that these were Short Brothers photos. It has been pointed out to us that this is not the case, and that acknowledgment should have been made instead to our contemporary *The Aeroplane*. We regret that this error occurred, but in extenuation of our "crime" we would quote the fact that the photographs in question bore on their backs the imprints of the rubber stamp of Short Brothers, and there was nothing to indicate that they originally emanated from 175, Piccadilly.

New Premises

THE latest news from J. Moss (Cambridge Circus), Ltd., Charing Cross Road, is decidedly encouraging, as their sales of both R.A.F. uniforms and civilian flying kit has necessitated extension of premises recently, still further extensions are under negotiation at the moment, which when completed will make a commanding "Moss" corner.

THE Pyrene Co., Ltd., notify us they are now operating from their new works situate on the Great West Road, Brentford. Anyone interested in these well-known fire-extinguishers should make a note of this address. The telephone number is Ealing, 6012.

IMPORTS AND EXPORTS

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1927 being given in FLIGHT, January 17, 1930.

	Imports.		Exports.		Re-exports.	
	1929.	1930.	1929.	1930.	1929.	1930.
Jan.	£ —	£ 2	£ 74,307	£ 147,935	£ 100	£ —
Feb.	6,532	2,460	195,369	226,049	2	1,000
	*9,384	5,447	269,676	373,984	102	1,000

* These totals are in accordance with the Government Trade Returns, although they do not cast up correctly, as will be seen, with the Government items as published each month. Apparently no official correction of past totals is thought necessary, the gross totals being arbitrarily altered.

PUBLICATIONS RECEIVED

Fifteenth Annual Report of the National Advisory Committee for Aeronautics, 1929. U.S. Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

U.S. National Advisory Committee for Aeronautics Reports: No. 311.—Aerodynamic Theory and Test of Strut Forms. By R. H. Smith. No. 323. Flow and Force Equations for a Body Revolving in a Fluid. By A. F. Zahm. No. 327.—The Effect of Supercharger Capacity on Engine and Airplane Performance. By O. W. Schey and W. D. Gove. No. 328. Water Pressure Distribution on a Twin-Float Seaplane. By F. L. Thompson. No. 329.—The Torsional Strength of Wings. By C. P. Burgess. No. 331.—Collection of Wind-Tunnel Data on Commonly Used Wing Sections. By F. A. Loudon. No. 336.—Tests of Large Airfoils in the Propeller Research Tunnel. Including Two with Corrugated Surfaces. By D. H. Wood. U.S. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

Technical Notes: No. 328.—The Effect of Fuel Consumption on Cylinder Temperatures and Performance of a Cooled Wright J-5 Engine. By O. W. Schey. Nov., 1929. No. 329.—Some Effects of Air Flow on the Penetration and Distribution of Oil Sprays. By A. M. Rothrock and E. G. Beardsley. Dec., 1929. U.S. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

Annual Report of the Board of Regents of the Smithsonian Institution for the Year ending June 30, 1928. United States Government Printing Office, Washington, D.C., U.S.A. Price \$2.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. (The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

APPLIED FOR IN 1929

Published March 20, 1930

- 24,161. H. P. H. ANDERSON and R. J. PETERSEN. Rotary engines. (325,556.)
35,725. COMMANDITAIRE VENNOOTSCHAP J. B. VAN HEIJST AND ZONEN. Device for throwing projectiles from aircraft. (325,611.)
38,411. F. W. HIGHFIELD. Radial-cylinder i.c. engines. (325,643.)

APPLIED FOR IN 1930

Published March 20, 1930

809. H. JUNKERS. Control gear for aircraft. (304,129.)
4,510. L. and A. SEGUIN. Radial-cylinder i.c. engines. (306,942.)

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